



BUILDING CODE

1976 EDITION

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Department of Building and Safety**

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LOS ANGELES BUILDING CODE

. . . By Way of Explanation

City of Los Angeles building code enforcement was established in 1889 with the appointment of the first superintendent of building. This local ordinance is designed simply to protect the public health and safety, and does not necessarily concern itself with esthetics. The Code imposes minimum restrictions necessary to maintain these standards of health and safety.

Through the intervening years the code has been amended and revised regularly to keep pace with the ever changing technology of the construction industry and new and proven concepts of structural design.

The Los Angeles Department of Building and Safety is the largest operation of its kind in America. It has a staff of close to 800 employees, serving a jurisdiction of 457 plus square miles.

A five-man Board of Building and Safety Commissioners, outstanding private citizens appointed by the Mayor, who serve without pay, functions in an advisory and appellate capacity to the Department of Building and Safety.

Major amendments to the building code are now programmed for a frequency of approximately every two years. Amendments are drafted with the counsel of responsible elements of the construction industry—architects, engineers, building contractors and others. Before any amendment is recommended to the City Council for adoption by the Department of Building and Safety, it is put out for study and criticism by the construction industries committee of the Los Angeles Chamber of Commerce, numerous other industry trade associations and leading private building professionals. Public hearings are held to assure that new building laws are made by the most democratic of processes.

In addition to regulating new construction, the Department of Building and Safety is charged with the responsibilities of policing excavation and grading of raw land; slum clearance (through its highly successful Conservation Bureau program); Sawtelle urban renewal; rehabilitation of buildings; elevators; boilers; fire alarm and police signals; testing of new products and materials to be used in construction; and other duties.

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Building Code and Permit Information, 485-3431

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The following districts are all part of the incorporated city of Los Angeles and are under the jurisdiction of this Code:

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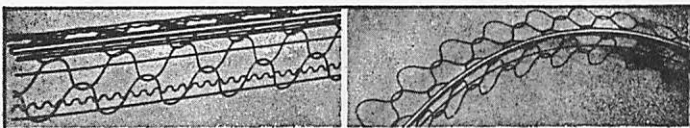
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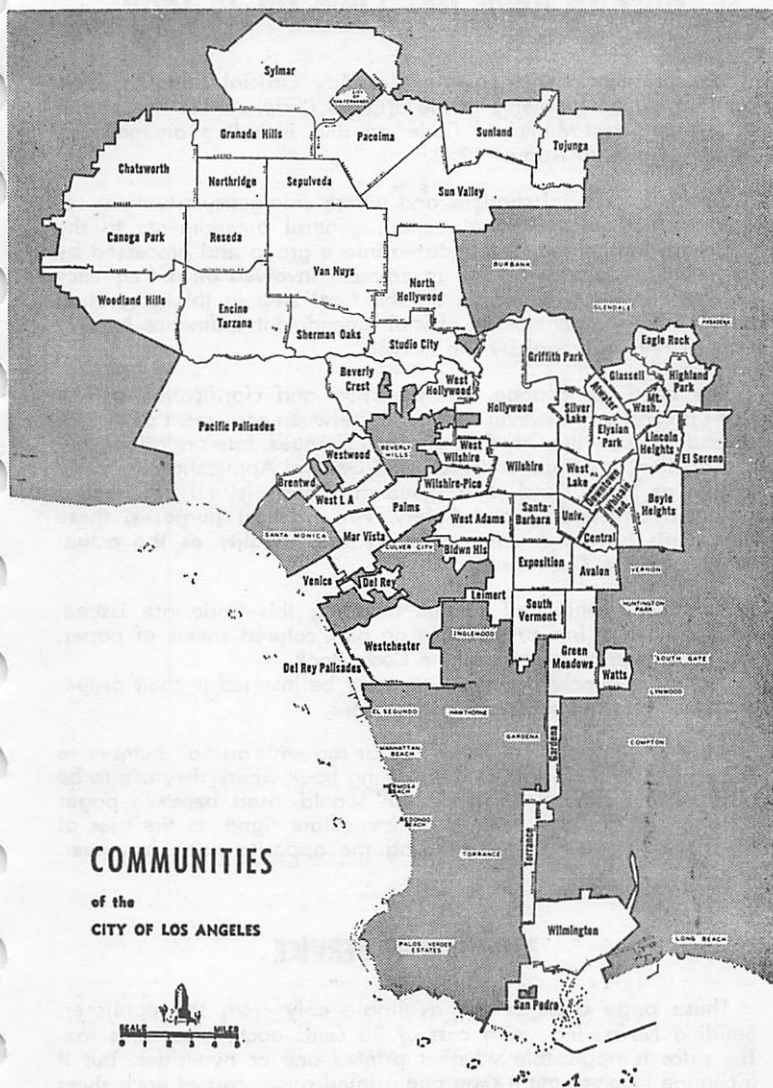
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AMENDMENT SERVICE

How To Keep This Code Up To Date

This printing of the Los Angeles City Official Building Code contains all amendments to the original Code, Article 1, Chapter 9, Los Angeles Municipal Code, to and including amendments effective through August 1978.

Except for special changes and where emergency situations require immediate individual action, general amendments to the Code are formulated, accumulated into a group and processed by the various agencies of city government involved on a frequency of about every two years . . . the final step in this processing being the enactment of an official amendment ordinance by City Council and approval by the Mayor.

The need for change, interpretation and clarification of the Code is constant, however — and, in between enactment of official amendments by the City Council, such changes, interpretations and clarifications are handled by Rules of General Application (formerly known as Resolutions), and Research Reports issued by the Department of Building and Safety. **For practical purposes, these documents have the same authority and legality as the actual context of the Code itself.**

As amendments and rulings affecting this Code are issued, Building News, Inc. prints these on pink colored sheets of paper, the exact size of a page in the Code Book.

These are punched so that they may be inserted in their proper sequence into deluxe loose leaf editions.

All change pages are numbered at top with an "a" number to correspond to the pages in the existing book where they are to be inserted. For example, page "72a" would insert between pages 72 and 73. The pink color is an immediate signal to the user of the book that a change affecting the opposite page has been made.

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These page changes are available **only** from the publisher, Building News, Inc., at a cost of 30 cents each, plus sales tax. The price is applicable whether printed one or two sides, but if a change involves more than one printed page, cost of each sheet is 30 cents. When any one change is purchased in quantities there is a discount.

For sake of identification, these changes are numbered consecutively at the top.

AMENDMENT SERVICE

(Continued from Page 6)

These page changes may be obtained in one of four manners:

1. By a visit to the Building News office (3055 Overland Ave., Los Angeles, Calif. 90034, open daily, Monday thru Friday, from 8:30 a.m. to 5 p.m.) and purchase over the counter.
2. By a prepaid mail order (after determining number of changes desired). No phone orders will be accepted. All orders must be prepaid by mail in advance before mailing. Check should be made payable to Building News, Inc., and order should clearly state (1) Serial number of changes desired; (2) Title of Code Book; (3) Number of change sheets desired. To compute amount of check, multiply number of page changes times 30c, add 6% sales tax and 60c for mailing service charge.

All orders should be mailed to: Building News, Inc., P.O. Box 3031, Terminal Annex, Los Angeles, Calif. 90051.

3. By subscription to the Amendment Service. Subscribers to this service, upon entering their subscriptions, are immediately mailed all previously printed pages to bring their Code Book up to date, and are automatically mailed all future changes as printed.

The charge for this service is the usual 30c per sheet, plus 2c sales tax per sheet (or 6% for multiple purchases), plus an annual service charge of \$3.00 per code to cover mailings and record keeping. The \$3.00 annual service charge is applicable for each different code book serviced. i.e., Zoning, Building, Electrical, etc. If more than one Code book of a particular title is serviced, the charge of the second, third, etc. is \$1.50 each.

In order to avail themselves of this service, subscribers to the Amendment Service must maintain a minimum deposit of \$10 per book serviced at all times with Building News, Inc. For all books over one serviced for the same subscriber this deposit is reduced to \$5 per book. As mailings are made of page changes, charges are made against deposits in accordance with above described prices. Such charges are accumulated and billed against deposits once per year, on June 30.

HOW TO DETERMINE IF THERE HAVE BEEN ANY CHANGES TO THIS CODE SINCE PUBLICATION/AND HOW MANY

Write or phone the publisher, Building News, Inc., 3055 Overland Ave., Los Angeles, California 90034. Telephone 870-9871. In contacting the publisher, be sure to look on the title page and give him (1) Exact title of code book; (2) Year of edition; and (3) Printing number, if one appears.

Table of Contents

	Page No.
DIVISION 1 — ADMINISTRATION, General	
Sec. 91.0101—91.0103	13-19
DIVISION 2 — ADMINISTRATION, (Permits, Plans, Fees)	
Sec. 91.0201—91.0212	20-29
DIVISION 3 — ADMINISTRATION, (Enforcement)	
Sec. 91.0301—91.0318	30-44
DIVISION 4 — DEFINITIONS	
Sec. 91.0401—91.0404	45-57
DIVISION 5 — OCCUPANCY, General	
Sec. 91.0501—91.0513	58-72
DIVISION 6 — GROUP A OCCUPANCIES	
Sec. 91.0601—91.0608	73-74
DIVISION 7 — GROUP B OCCUPANCIES	
Sec. 91.0701—91.0707	75-77
DIVISION 8 — GROUP S OCCUPANCIES	
Sec. 91.0801—91.0809	78-84
DIVISION 9 — GROUP D OCCUPANCIES	
Sec. 91.0901—91.0908	85-87
DIVISION 10 — GROUP E OCCUPANCIES	
Sec. 91.1001—91.1073	88-100
DIVISION 11 — GROUP F OCCUPANCIES	
Sec. 91.1101—91.1109	101-104
DIVISION 13 — GROUP H OCCUPANCIES	
Sec. 91.1301—91.1302	105-106
DIVISION 14 — GROUP R OCCUPANCIES	
Sec. 91.1401—91.1402	107
DIVISION 15 — GROUP J OCCUPANCIES	
Sec. 91.1501—91.1506	108
DIVISION 16 — FIRE DISTRICT REGULATIONS	
Sec. 91.1601—91.1608	109-115
DIVISION 17 — TYPES OF CONSTRUCTION	
Sec. 91.1701—91.1712	116-129
DIVISION 18 — TYPE I BUILDINGS	
Sec. 91.1801—91.1802	130
DIVISION 23 — LOADS AND GENERAL DESIGN	
Sec. 91.2301—91.2311	131-150
DIVISION 24 — MASONRY	
Sec. 91.2401—91.2420	151-176
DIVISION 25 — WOOD	
Sec. 91.2501—91.2518	177-219
DIVISION 26 — CONCRETE	
Sec. 91.2601—91.2623.4.3	220-242
DIVISION 27 — STEEL	
Sec. 91.2701—91.2703	243-246
DIVISION 28 — FOUNDATIONS AND RETAINING WALLS	
Sec. 91.2801—91.2811	247-257

Table of Contents

(Continued)

DIVISION 29 — VENEERED WALLS	
Sec. 91.2901—91.2904	258-262
DIVISION 30 — GRADING, EXCAVATIONS AND FILLS	
Sec. 91.3001—91.3013	263-280
DIVISION 31 — WOOD PRESERVATIVES	
Sec. 91.3101—91.3108	281-283
DIVISION 32 — ROOF CONSTRUCTION AND COVERING	
Sec. 91.3201—91.3203	284-288
DIVISION 33 — STAIRS, EXITS AND OCCUPANT LOADS	
Sec. 91.3301—91.3322	289-308
DIVISION 36 — ROOF STRUCTURES	
Sec. 91.3601—91.3604	309-311
DIVISION 37 — CHIMNEYS AND HEATING APPLIANCES	
Sec. 91.3701—91.3707	312-315
DIVISION 39 — STAGES	
Sec. 91.3901—91.3904	316-318
DIVISION 40 — MOTION PICTURE PROJECTION	
Sec. 91.4001—91.4008	319-320
DIVISION 41 — SPECIAL ROOMS HOUSING HAZARDOUS MATERIALS—OR HAZARDOUS USES	
Sec. 91.4101—91.4113	321-328
DIVISION 42 — INTERIOR WALL AND CEILING FINISH	
Sec. 91.4201—91.4204	329-330
DIVISION 43 — FIRE-RESISTIVE STANDARDS	
Sec. 91.4301—91.4307	331-346
DIVISION 44 — CONSTRUCTION SAFETY AND SANITARY PROVISIONS	
Sec. 91.4401—91.4408	347-351
DIVISION 45 — PROJECTIONS FROM BUILDINGS	
Sec. 91.4501—91.4510	352-357
DIVISION 47 — LATHING, PLASTERING AND INSTALLATION OF WALLBOARD	
Sec. 91.4701—91.4714	358-372
DIVISION 48 — DWELLINGS AND ACCESSORY BUILDINGS	
Sec. 91.4801—91.4825	373-406
DIVISION 49 — HOUSING REQUIREMENTS	
Sec. 91.4901—91.4935	407-431
DIVISION 52 — SIGNS	
Sec. 91.5201—91.5213	432-441
DIVISION 54 — RELOCATION PERMIT	
Sec. 91.5401—91.5412	442-447
DIVISION 61 — PLASTICS	
Sec. 91.6101—91.6103	448
DIVISION 67 — SECURITY	
Sec. 91.6701—91.6732	449-453
APPENDIX, Index to Rules of General Application, Dangerous Buildings, Excerpts from Plumbing; Heating, Ventilating, Air Conditioning and Refrigeration; and Electrical Codes, Maps	454-484
INDEX	485

DEPT. OF BUILDING AND SAFETY

SEMI-ANNUAL INDEX

The City of Los Angeles Dept. of Building and Safety publishes a semi-annual Index For Manufactured Products, Fire-Resistive Construction Equipment, Alternate Construction Methods, Board Rulings and Rules of General Application.

Publication dates are approximately January 1 and July 1 each year.

This Index is a very valuable adjunct to the Building Code. Copies of same may be purchased for a cost of \$3.00 from the Supply Division of the Department of Building & Safety, Room 498, Los Angeles City Hall, 200 No. Spring St., Los Angeles, Calif. 90012.

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CONCERNING THE ARROW SIGNALS IN THE TEXT

As a convenience to users of this Building Code, all official amendments which have been enacted to the Code since its last printing in 1976 are visually signaled in type by the use of enclosing arrows. At the beginning point in the Code text where the change occurs an arrow like this ➤ pointing right is inserted. At the point where the change ends an arrow like this ➤ pointing left is inserted. Thus changes which have been made in the old Code are clearly and distinctly pointed out — and it is not necessary to make a detailed comparison between the two books to ascertain what has changed and what is new.

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DIVISION 1 — ADMINISTRATION

General

SEC. 91.0101 — TITLE AND PURPOSE

(a) **Title.** This Article shall be known as the "Los Angeles Building Code," a portion of the "Los Angeles Municipal Code," and wherever the word "Code" is used in this Article it shall mean the "Los Angeles Building Code."

(b) **Purpose.** The purpose of this Article is to safeguard life, limb, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of all buildings and structures erected or to be erected within the City, and by regulating certain grading operations within the City.

SEC. 91.0102 — SCOPE

(a) No person shall construct, alter, repair, demolish, remove, move, use, occupy or maintain, within the City, any building or structure or any portion thereof, except as provided by this Code.

No person shall grade, excavate or fill any land except as provided by this Code.

The permissive provisions of this Code shall not be presumed to waive any limitations imposed by other statutes or ordinances of the State or City.

All of the provisions of this Code shall be limitations for safeguarding life, limb, health, property and public welfare.

If two or more pertinent limitations are not identical, those limitations shall prevail which provide the greater safety to life or limb, health, property or public welfare.

(b) **Exceptions.** The provisions of this Code shall not apply to any of the following:

1. A children's playhouse accessory to a dwelling and not located in Fire District Nos. 1 or 2, provided the playhouse is not more than eight feet in length, width or height and does not contain any heating, plumbing or electrical installation.

2. Masonry or concrete fences not over six feet high, and other fences not over 10 feet high;

3. Oil derricks;

4. Towers or poles supporting communication lines or power transmission lines;

5. Cases, counters and partitions, not over five feet \times high.

6. Replacement of sheet and plate glass in openings of buildings erected prior to February 27, 1959, other than glazing in locations which may be subject to human impact as specified in Section 91.1711(d);

7. Repealed by Ord. No. 122,171;

8. Retaining walls which are not over four feet in height, measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or sloping earth, or impounding flammable liquids;

9. Water tanks, and their supporting structures, if not upon a building, if no portion is more than 15 feet above the ground, and if the capacity does not exceed 5,000 gallons;

10. Motion picture sets when not supported by any portion of any building;

11. Platforms, walks and driveways not more than two feet

above the ground or floor and not over any basement or story below;

12. Pergolas and lath houses, both of which shall be outside of any Fire District, not over 400 square feet in area, and not supported by or attached to any portion of any building;

13. Painting, papering and similar work; provided, however, that the values thereof shall be included as part of the value of any new construction for which a permit is required by this Code, for the purpose of determining the amount of the fee to be paid for such permit; and provided further, that this exception does not include operations such as liquid washing, compressed air cleaning and steam cleaning on the exterior surfaces of buildings adjacent and within 20 feet of pedestrian walkways in dedicated streets where such operations extend above the first story;

14. Work in a public way, dams, and drainage structures constructed by or under contract with the Board of Public Works, the Department of Water and Power, and the County Flood Control District unless the structure forms a portion of the support for a building or a structure coming within the jurisdiction of the Department of Building and Safety;

15. Class 2 and 3 incinerators, as defined elsewhere in the Los Angeles Municipal Code;

16. Tanks for the storage of flammable liquids if resting upon the surface of the ground and surrounded by an impounding basin conforming to the requirements of Article 7 of Chapter 5 of the Los Angeles Municipal Code (Fire Code).

17. Portable amusement devices and structures, including merry-go-rounds, ferris wheels, rotating conveyances, slides, similar devices, and portable accessory structures whose use is necessary for the operation of such amusement devices and structures; any portable accessory structure included in the provisions of this Subdivision shall be limited to a cover or roof over each device, but shall not include any storage building or detached structure which is not an integral part of the device;

18. Isolated buildings not larger in area than 16 square feet, including roof projections and not more than eight feet in height, if separated by a distance of 20 feet or more;

19. Waterproof pointing of joints in masonry or veneer, also cleaning with detergents which are not injurious to clothing or skin of persons and are not removed by liquid washing, provided work is done from safely enclosed scaffolding which will collect any dust, debris or dropped tools and materials in use;

20. Nothing in this Code shall apply to any excavation, removal, fill, or deposit of any earth or other materials within a property which is dedicated or used, or to be used, for cemetery purposes, provided that such work does not affect the lateral support or increase the stresses in or pressure upon any adjacent or contiguous property not owned by the cemetery authority;

21. The mining, quarrying, excavating, processing, or stockpiling of rock, sand, gravel, aggregate or clay in a "G" Rock and Gravel District, as established and provided for in Section 13.03 of the Municipal Code, or where permitted by order of a court of competent jurisdiction;

22. The depositing of rubbish or other material at any dump operated by the City of Los Angeles, or by any person pursuant to the provisions of Sections 66.15 or 66.25 of the Municipal Code;

23. Nothing in this Code shall apply to grading in an isolated, self-contained area if the Department finds that by reason of such isolation and self-containment no danger to private or public property can now or thereafter result from grading operations;

24. ➤ Any portable metal hangar less than 2,000 square feet in size, located on a City-owned airport, used for the parking of aircraft only, and bearing evidence of approval by the Depart-

ment of Motor Vehicles of the State of California for movement on any highway. Such structure shall, as an integral part of its basic construction, be equipped with a hitch or coupling device for towing. It shall accommodate, without further major structural change, wheel and axle assemblies which will provide such structure with a safe means of portability. No water or sanitary facilities shall be permitted in such structure and it shall be equipped with permanent ventilation as required for subgroup F-1 occupancies. <

25. Radio and television antennae towers which do not exceed 45 feet in height or \$100.00 in value, or light standards which do not exceed 30 feet in height or \$100.00 in value;

26. Tents and trailers used for office or shelter purposes accessory to a Christmas tree sales lot during the month of December only, provided the aggregate area of all tents and trailers does not exceed 600 square feet for each sales lot. (Such tents are regulated by the Fire Department under Article 7, Chapter 5 of the Los Angeles Municipal Code.)

27. Tents accessory to a dwelling and not exceeding 450 square feet in area.

28. Signs not exceeding 20 square feet in area, placed upon the surface of the ground, no part of which extends more than six feet six inches above the underlying ground, which have no mechanical or moving parts or to which no electricity or other source of illumination or power are attached or made a part thereof. Such signs shall be separated from each other a minimum distance of 15 feet.

29. Boards and signs used exclusively to display official notices issued by any court or public officer in the performance of a public duty or by a private person in giving legal notice.

SEC. 91.0103 — APPLICATION TO EXISTING BUILDINGS

(a) Deteriorated or Hazardous Buildings. 1. Any portion of any building or structure which is a hazard to life or property as a result of deterioration or for any other cause, shall be brought up to a reasonable condition of stability and safety, or shall be made to conform to the regulations of this Code, or shall be demolished.

A building or portion thereof shall be presumed to be a hazard to life or property if any of the following conditions exist:

- (i) When the stresses in any member, computed on the basis of the loads specified in this Code, exceed twice the working stresses permitted by this Code.
- (ii) When any exit, fire protective construction, or safety device does not provide the degree of security to life and property required by the Los Angeles Municipal Code.
- (iii) When a building or structure which is a "Dangerous Building," "Substandard Residential Building," or "Residential Building Subject to Repair" as defined in the Los Angeles Municipal Code.

2. All buildings, structures and portions thereof shall be maintained in good repair. All exterior surfaces shall be reasonably protected from the elements and against decay by appropriate protective coating. Broken window glass shall be replaced. All masonry units shall be maintained with head, bed and wall joints solidly filled with mortar. The roof of every building or structure shall be kept waterproof. The premises of every building and structure shall be maintained free from accumulations of debris, rubbish, garbage, vermin and other similar matter.

(b) Parapet or Appendage—Maintenance. No building shall have any parapet or appendage attached to or supported by

an exterior wall of the building and located adjacent to a public way or to a way set apart for exit from a building or passage of pedestrians, if such parapet or appendage is not so adequately constructed, anchored or braced as to remain wholly in its original position in event of an earthquake having the effect designated by Division 23 of this Code.

Whenever the Department determines by inspection that an existing parapet or appendage is not so adequately constructed, anchored or braced as to remain wholly in its original position, the Superintendent of Building shall, by written notice addressed to the owner, person or agent in control of the building, designate and describe the hazards and inadequacies of construction, anchorage or bracing determined by such inspection and direct that the necessary corrections be made to insure that all of the parapet or appendage remain in its original position. Upon receipt of such notice, the owner, person or agent in control of the building where such parapet or appendage exists, shall, within one year from the date of such notice:

1. Submit to the Department suitable corrective plans;

2. Obtain the necessary alteration permit; and

3. Complete all the work necessary or ordered. All the plans thus submitted shall have the intent of eliminating the parapet or appendage, or reconstructing such parapet or appendage so that it will conform structurally with requirements of this Code, or strengthening such parapet or appendage by bracing or other means so that it will resist the forces of an earthquake and remain in its original position.

Any person receiving a notice as set out in this Subsection may appeal from the notice of the Department in the manner provided by Division 3 of this Code.

(c) **Adjustable Bracing System — Maintenance.** Buildings constructed with adjustable steel rod bracing systems designed to transfer horizontal forces, shall be subject to inspection after completion of the building or structure for the purpose of maintaining proper adjustments of bracing assembly. The owner shall be duly notified if adjustments are found necessary and, upon the receipt thereof, shall cause adjustments to be made satisfactory to the Superintendent of Building.

(d) **Alterations.** Any alterations may be made to any building in any location provided the building as altered conforms to the requirements of the Los Angeles Municipal Code for new buildings in the same location.

EXCEPTIONS: 1. *Alterations or repairs to any existing non-conforming building outside of every Fire District may be of the same type of construction as the existing building, provided the aggregate value of such alterations or repairs in any two-year period does not exceed 50 per cent of the replacement value of the building.*

2. *Alterations or repairs may be made to any building in any location provided the new construction conforms to that required for a new building of like area, height and occupancy in the same location.*

(e) **Change of Occupancy.** The change of occupancy of any existing building shall be as required by Section 91.0315 (b).

(f) **Additions.** Additions may be made to any building outside of any Fire District provided the new portion conforms to the requirements of this Code for new buildings of the same or higher degree of fire-resistance than the original building, and provided the entire building as altered conforms to the requirements of this Code with respect to area and height.

Additions conforming to the construction of the original building may be made to nonconforming one-story buildings outside of any Fire District provided the addition, in any two-year

period, is not in excess of 200 square feet or 50% of the area of the original building.

Buildings within the Fire Districts may be added to only as specified in Section 91.1602 (Fire District Regulations).

(g) **Moving.** Every building moved from a location outside of the City to a location within the City shall be made to conform to all of the requirements of this Code for a new building in the same location within the City and to all other applicable laws.

Any building within the City may be moved to any location outside of any Fire District provided that in the new location, it conforms to the requirements of this Code with respect to location, ventilation, space under the floor, underpinning, footings and foundations.

All buildings before moving shall be inspected as specified in Division 54 of this Code.

(h) **Demolition.** Any building in the City may be completely wrecked or demolished in accordance with the provisions of this Code.

(i) **Existing Illegal Buildings.** Every existing building or portion thereof constructed without a building permit shall be made to conform or shall be demolished.

(j) **Illegal Buildings Displayed for Sale.** No building or structure or portion thereof shall be displayed for sale purposes unless conforming to all the requirements of this Code.

EXCEPTION: This does not apply to buildings to remain on the site, nor to existing buildings to be relocated in conformance with Subsection (g) of this Section.

(k) **Sandblasting.** No building or other structure shall be sandblasted except by a wet process precluding the creation of dust and dry debris.

Inspection shall be made by the Department of Building and Safety after scaffolding and protective enclosure is in place, and before work is started.

EXCEPTION: Dry sandblasting may be permitted by the Department only when evidence is submitted that this process is necessary for the proper cleaning of the building or structure. No permission may be granted unless it can be shown that the use of this process will not be detrimental to adjoining property or public welfare.

(l) **Protection of Adjacent Property.** No sandblasting, spray painting, demolition, excavating, grading or other building construction operations shall be carried on in a manner that will be detrimental or injurious to adjacent property, or pedestrians, or vehicles using the streets or sidewalks in the vicinity of the operation.

Adjacent property owners shall be notified by the owner or his agent in advance of any proposed grading or excavation in excess of 50 cubic yards when such grading or excavation extends more than five feet in depth and below a 45° line projected downward from the property line at the existing ground surface. Notification shall be by placards conspicuously posted by the owner or his agent along the property line where the grading or excavation is proposed at least 10 days prior to the start of such grading or excavation. The size and form of the placard shall be determined by the Department.

(m) **Maintenance of Protective Devices.** The owner of any property in hillside areas on which an excavation or fill has been made pursuant to a permit granted under Division 2 of this Code, or any other person or agent in control of such property, shall maintain in good condition and repair all retaining walls, cribbing, drainage structures and other protective devices shown in the approved plans and specifications submitted with the application for a permit.

(n) **Hazardous Soil and Earth Conditions.** Whenever the Department determines by inspection that any land or any existing excavation or fill has, from any cause, become a menace to life or limb, or endangers public or private property, or affects the safety, usability or stability of a public way, the owner or other person in legal control of the property concerned shall, upon receipt of a written notice thereof from the Department, correct such condition in accordance with the provisions of Division 30 of this Code and the requirements and conditions set forth in such notice so as to eliminate the condition complained of. The owner or other person in legal control of such property shall immediately commence the work required by such notice and shall complete such work within 180 days from the date of such notice unless a shorter period of time for completion has been specified in the notice, in which case the owner shall comply with such shorter period of time. Upon written application therefor the Superintendent of Building may approve a request for an extension of time to complete the work required by such notice.

(o) **Buildings, Structures, and Portions thereof Which Constitute a Nuisance or Are a Hazard to Life or Property.**

Whenever the Department determines that any building, structure, or portion thereof constitutes a nuisance or is a hazard to life or property, it shall order that such be repaired or demolished. (For purposes of this subsection, the term "nuisance" shall include, but is not limited to, buildings which have been uninhabited for a period of three months and have been damaged or vandalized.)

The order shall be in writing and shall be served upon the owner as shown in the last equalized assessment roll or upon the person in charge or control of this site. The order shall specify the conditions which exist which cause the building, structure, or portion thereof to be classified as a nuisance or a hazard, and shall require that the necessary permits be obtained to effect the designated repairs or demolition. Compliance with the terms of the order shall be effected within 30 days after the service thereof.

➤At the time that the Department serves the aforementioned order, the Superintendent of Building shall file with the Office of the County Recorder a certificate stating that the subject building has been determined to be a nuisance or a hazard to life or property and ordered repaired or demolished, and that the owner thereof has been so notified. <

The person served with an order to repair or demolish may appeal to the Board from the requirements thereof. Such appeal must be taken within 30 days of the service thereof, and be in accordance with such procedures as the Board may establish. Upon such appeal, the Board may affirm, annul or modify the order, or any of the terms or conditions thereof. Provided, however, that any appeal to the Board for an extension of time to repair a vacant privately-owned building shall be decided by the Board no later than 30 days after the hearing thereon and may only be granted upon the condition that such repairs be completed within a maximum period of 180 days and upon the further condition that no additional time will be granted.

Whenever compliance with an order issued pursuant to the provisions of this subsection has not been accomplished within the time set therefor or such additional time as may have been granted by the Department or the Board, the Department shall institute appropriate action to secure such compliance or shall cause the correction or removal of the conditions specified in the order in the manner provided by law.

When the correction or removal of the hazardous condition is accomplished by the Department, the cost thereof shall be paid from the "Repair and Demolition Fund" as established in Section 96.120 of the Municipal Code, and such costs shall be assessed

against the property upon which such conditions exist in accordance with the provisions of Sections 96.120.1 and 96.121 of the Municipal Code. The proceedings for assessment of such costs shall be in accordance with Sections 96.119, 96.119.1, 96.120.1 and 96.121 of the Municipal Code.

➤ After the building has been repaired or demolished, the Superintendent of Building shall file with the Office of the County Recorder a certificate terminating the status of the subject building as being a nuisance or hazard to life or property. <

(p) Fire Safety in Existing ➤ Buildings. 1. Notification. Whenever the Fire Department pursuant to Section 57.01.22 of the Los Angeles Municipal Code, determines by inspection that a building does not conform to the minimum requirements of either Sections 91.0507, 91.0909 or 91.1302 of this Code, it shall prepare an order in writing that such building be repaired and modified so as to conform to such minimum requirements.

The order shall specify in what manner the subject building fails to meet the minimum requirements of either Sections 91.0507, 91.0909 or 91.1302 of this Code and shall direct that plans be submitted and necessary permits be obtained not later than one year after the service of the order, and that necessary corrections shall be completed not later than two years after such service. The order shall be transmitted to the Department of Building and Safety for enforcement purposes. The Department of Building and Safety shall serve such order either personally or by certified or registered mail upon the owner as shown on the last equalized assessment roll and upon the person, if any, in real or apparent charge or control of the building. The provisions of this Section are not intended to prevent the Department of Building and Safety from making such determination or order. <

2. Recordation. At the time that the Department of Building and Safety serves the aforementioned order, the Superintendent of Building shall file with the Office of the County Recorder a certificate stating that the subject building does not meet the minimum fire safety requirements of ➤ Sections 91.0507, 91.0909 or 91.1302 of this Code, and that the owner thereof has been so notified.

After all necessary corrective work has been performed, the Superintendent of Building shall file with the Office of the County Recorder a certificate terminating the status of the subject building as non-conforming to the minimum fire safety requirements of Sections 91.0507, 91.0909 or 91.1302. <

3. Enforcement. If the owner or other person in charge and control of the subject building fails to comply with the aforementioned order within the time periods set forth in Subdivision 1 of this subsection the Superintendent of Building shall order that the building be vacated and that the building remain vacated until all required corrective work has been completed. Whenever compliance with the correction order issued pursuant to the provisions of this subsection has not been accomplished within 90 days after the date the building has been ordered vacated, or such additional time as may have been granted by the Board, the Superintendent may order its demolition in accordance with the provisions of Subsection (c) of this Section.

(q) The recirculation and purification system of any swimming pool, fish pond, or any other body of water which is required to be fenced by Subsection 91.4407(a), shall be operated and maintained so as to keep the water in such pool or other body of water clean and of reasonable clarity.

In order to define reasonable clarity of the water in such pool, pond or body of water, the following standard shall be applied:

A painted black disk, 6" in diameter on a 12" x 12" white tile, placed at the bottom of the pool at its deepest point, shall be clearly visible from the sidewalks around the pool from all distances up to 10 yards from such disk, or the water is determined to not be of reasonable clarity.

DIVISION 2 — ADMINISTRATION

Permits, Plans, Fees

SEC. 91.0201 — PERMITS REQUIRED

(a) **Building Permits.** No person shall erect, construct, alter, repair, demolish, remove or move any building or structure, nor shall any person commence any sandblasting, liquid washing, compressed air cleaning or steam cleaning of exterior surfaces of any building unless he has obtained a permit therefor from the Department. A separate permit shall be obtained for each separate building or structure except that a group of temporary structures erected on one site for a limited period of time may be included on one permit.

Where the installation, alteration or repair of ventilation equipment or duct work is not included within the scope of a valid building permit, a separate building permit shall be obtained for the work.

Sandblasting, liquid washing, compressed air cleaning, steam cleaning of exterior surfaces of buildings adjacent to and within 20 feet of pedestrian walkways in dedicated streets in the limits of Fire District No. 1 shall be done only between the hours of 11:00 o'clock P.M. and 7:00 o'clock A.M., or on Sundays.

➤ Where complete plans for a proposed building are filed with the Department and where a foundation only permit is issued with respect thereto in accordance with rules established by the Superintendent of Building pursuant to Section 22.19 of the Los Angeles Administrative Code, a building permit may be issued for the remainder of the building within one year after the issuance of the foundation only permit, provided such plans and specifications comply with all applicable Los Angeles Building Code provisions in effect at the time of issuance of such foundation only permit. <

➤ **EXCEPTIONS: PERMIT NOT REQUIRED FOR:** 1. *Where the work regulated by this Code is valued at \$200.00 or less, unless it affects the structural stability of a building, or public safety, or is done to make a building conform to the requirements of this Code for a change in occupancy.*

2. *Flag poles and towers not erected upon a building and not more than 15 feet high.*

3. *Construction sheds and sidewalk protection canopies built pursuant to Division 44.*

4. *Reroofing work outside of any Fire District or Fire Buffer Zone.*

5. *Liquid washing, compressed air cleaning, steam cleaning of buildings outside of Fire Districts No. 1 and No. 2 and also those exterior surfaces of buildings which are located more than 20 feet from pedestrian walkways in dedicated streets.*

6. *Prefabricated platforms using approved metal underpinning and approved decking not more than 48 inches above the ground or floor, not over any basement or story below and supporting not more than 10 occupants at any one time.*

7. *Exhibits, booths, partitions and display counters for temporary use not exceeding 30 days in conjunction with an exhibit or show and not exceeding 12 feet in height above the floor.*

8. *Outdoor tents or cloth structures for temporary use not exceeding 30 days and not exceeding 12 feet in any dimension, provided such tents are accessory to an indoor or outdoor assembly use on the site.*

9. *Swimming, bathing, and wading pools not exceeding 84 inches in depth or having a surface area not exceeding 250 square feet.*

10. *Canopies or awnings located outside of Fire Districts No. 1 and No. 2 extending not more than four feet from*

the exterior wall of the building and attached to a Group R or H Occupancy. <

(b) No person shall commence or perform any grading, and no person shall import or export any earth materials to or from any grading site, without first having obtained a permit therefor from the Department.

A separate permit shall be required for each grading site. One permit may include the entire grading operation at that site, however.

EXCEPTIONS: All other provisions of the Code shall apply, but a permit will not be required if the work complies with any one of the following conditions:

1. The excavation does not exceed five feet in vertical depth at its deepest point measured from the original ground surface and does not exceed 50 cubic yards of material.

2. The fill does not exceed three feet in vertical depth at its deepest point measured from the natural ground surface and does not exceed 50 cubic yards of material on any one lot. No such fill shall be placed on a surface having a slope steeper than ten horizontal to one vertical, and no fill shall be made which will change the existing drainage pattern.

3. An excavation below finished grade for basements and footings of a building, swimming pool, or underground structure authorized by a valid building permit from the Department. This exception shall not affect the applicability of this Code to, nor the requirement of a grading permit for any fill made with the material from such excavation.

(c) **Temporary Permits.** Before commencing the construction of any work for temporary use, a building permit authorizing such work shall be obtained from the Department. Such construction shall be occupied or used only for the period set forth on the permit application, but shall not exceed 120 days.

Except for tents and bleachers, application for permit shall be filed at least seven days prior to the construction, erection or operation of any device, structure, or any work regulated by this Article for temporary use.

All temporary construction or installations shall be demolished or removed within five days after the expiration of the Certificate of Occupancy. Request for inspection must be received by the Department at least two days prior to public use or occupancy.

SEC. 91.0202 — SCOPE OF PERMIT

(a) **Limit of Authorization.** The issuance of a permit is not an approval or an authorization of the work specified therein. A permit is merely an application for inspection, the issuance of which entitled the permittee to inspection of the work which is described therein.

(b) **Validity of Other Laws.** Neither the issuance of a permit nor the approval by the Department of any document shall constitute an approval of any violation of any provision of this Code or of any other law or ordinance, and a permit or other document purporting to give authority to violate any law shall not be valid with respect thereto.

(c) **Official Grades.** The applicant shall satisfy himself as to the correctness of proposed structure elevations and locations with respect to the official grades of public streets and to the policy of the Board of Public Works relative to the location and length of curb depressions for driveways.

SEC. 91.0203 — APPLICATION FOR BUILDING PERMITS

To obtain a permit, the applicant shall file an application on a form furnished by the Department. One complete application for each permit shall be filed.

Upon compliance with the provisions of this Division, the Department shall issue a permit to the applicant.

EXCEPTIONS: 1. The Department shall have the authority to withhold a permit for any building where no public sewers are available and the provisions of Article 4, Chapter 9, of this Code prohibit the use of a private sewage disposal system.

2. The Department shall have the authority to withhold a building permit where the proposed building site is in an area subject to slides or unstable soil. If the Department finds that the above hazards are not likely to be of such extent as to be an immediate hazard to occupancy of the proposed building, the Department shall issue a building permit upon receipt of a sworn affidavit which has been recorded by the County Recorder, stating that the applicant is fully aware that the site is in an area subject to slides or unstable soil.

3. The Department shall have the authority to withhold a building permit where the proposed building site is in an area subject to inundation. If it can be shown by authentic past records that any possible inundation is not likely to be of such extent as to be an immediate hazard to occupancy of the proposed building, the Department shall issue a building permit upon receipt of a sworn affidavit which has been recorded by the County Recorder stating that said applicant is fully aware of the Department's finding that the structure is in an area subject to inundation.

➤ 4. The Department shall have the authority to withhold permits on projects located within a Special (Fault) Studies Zone established under Chapter 7.5, Division 2, of the California Public Resources Code. Permits may be issued if it can be demonstrated through accepted geologic-seismic studies that the proposed structure will be located in a safe manner and not over or astraddle the trace of an active fault. Acceptable geologic-seismic studies shall meet the criteria as set forth in rules and regulations established by the Superintendent of Building to assure that such studies are based upon sufficient geologic data to determine the location or non-existence of the active fault trace on a site. Prior to approval of a project, a geologic report defining and delineating any hazard of surface fault rupture shall be required. If the City finds that no undue hazard of this kind exists, the geologic report on such hazard may be waived, with approval of the State Geologist.◀

Areas requiring the affidavit specified in Exceptions 2 and 3 above shall be established by the Department after public hearings on the location of such areas are held by the Board of Building and Safety Commissioners.

SEC. 91.0203.1 — VIOLATIONS

Every person who knowingly and willfully procures a building and/or grading permit without the consent of the owner of record of the property for which the permit is issued, or his agent, is guilty of a misdemeanor.

EXCEPTIONS: This Section shall not apply to building and/or grading permits obtained pursuant to and in compliance with an order of a court of law or a governmental agency.

SEC. 91.0204 — PERMIT FEES

(a) Fees. Before issuing any building permit required by this Code, the Department shall collect a fee.

The amount of the building permit fee shall be as shown in Table No. 2-A for the total value of all construction or work for which the permit is issued, including all painting, papering,

roofing, electrical work, plumbing, permanent or fixed heating equipment, elevator equipment, fire sprinkler equipment and any other permanent portions or permanent equipment, except as provided in Section 91.0102 of this Code.

No portion of any building, including mechanical, electrical, and plumbing work, shall be excluded from the valuation for a building permit because of any other permits required by any governing agency.

(b) Subsection repealed.

(c) **Additional Building Permit Fees.** The fee for a supplementary building permit to cover any additional valuation for work included in the original permit, shall be the difference between the fee paid for the original permit and the fee which would have been required had the original permit included the entire valuation.

The fee for a building permit authorizing changes from approved plans or specifications shall be the fee required for a valuation equal to the increase in valuation caused by the change, but no refund shall be made if the change causes a reduction of valuation.

➤ **TABLE 2-A PERMIT FEES***

TOTAL VALUATION		FEE	
From	To		
\$ 0.00	100 inc.	None	
100.01	1,000 inc.	\$ 5.00 plus	\$.80 per \$100 or fraction thereof of total valuation
1,000.01	20,000 inc.	\$ 7.00 plus	\$.60 per \$100 or fraction thereof of total valuation
20,000.01	50,000 inc.	\$ 37.50 plus	\$4.50 per \$1000 or fraction thereof of total valuation
50,000.01	100,000 inc.	\$ 77.00 plus	\$3.70 per \$1000 or fraction thereof of total valuation
100,000.01	500,000 inc.	\$197.00 plus	\$2.50 per \$1000 or fraction thereof of total valuation
500,000.01	1,000,000 inc.	\$297.00 plus	\$2.30 per \$1000 or fraction thereof of total valuation
Over	1,000,000	\$597.00 plus	\$2.00 per \$1000 or fraction thereof of total valuation

* ➤ The permit fee specified in the table above shall be increased by five percent for R and H occupancies and 10 percent for all other occupancies for construction or work required to comply with the rules and regulations adopted by the Energy Resources Conservation and Development Commission of the State of California. ◀

(d) **Awning Installation and Maintenance—Fees.** Every awning erected and arranged so that temporary shelter may be provided over any portion of a public way shall be subject to an installation fee as follows:

New awnings: \$5.00 per awning installation per building, or ten cents per front foot of awning, whichever is the greater amount.

Recovered Installation: \$2.50 per awning installation per building, or five cents per front foot of awning, whichever is the greater amount.

(e) **Grading Permit.** Before issuing any grading permit, the Department shall collect a fee, the amount of which shall be as shown in the following table:

➤	GRADING PERMIT FEES	(Fee)
(Grading)		
100 cubic yards or less		\$ 50.00
101-1,000 cubic yards		50.00
for the first 100 cubic yards, plus \$50.00 for each additional 100 cubic yards or fraction thereof,		
1,001-10,000 cubic yards		\$500.00
for the first 1,000 cubic yards, plus \$50.00 for each additional 1000 cubic yards or fraction thereof,		
10,001-100,000 cubic yards		\$950.00
for the first 10,000 cubic yards, plus \$150.00 for each additional 10,000 cubic yards or fraction thereof.		
100,001 cubic yards or more		\$2300.00
for the first 100,000 cubic yards, plus \$75.00 for additional 10,000 cubic yards or fraction thereof.		◀

(f) **Additional Grading Permit Fees.** The fee for a grading permit authorizing additional work to that under a valid permit shall be the difference between the fee paid for the original permit and the fee shown for the entire project.

(g) **Plan Maintenance Fees.** Before issuing a building permit, the Department shall collect a fee for maintaining building plans which are required to be retained by Section 91.0211(f) of this Code.

The amount of the plan maintenance fee shall be two percent of the building permit fee but not less than \$5.00 nor more than \$250.00 and shall be collected for each separate plan to be retained by the Department.

SEC. 91.0205 — PERMIT CARDS

With each permit issued, the Department shall furnish a card to the applicant, showing the location and nature of the work to be done and the number of the permit.

The permit card shall be posted in a place designated by the Superintendent of Building.

SEC. 91.0206 — REVOCATION AND EXPIRATION OF PERMITS

(a) **Revocation of Permits.** Permits may be revoked as provided for in Section 98.0602.

(b) **Expiration of Permits.** Permits may be expired as provided for in Section 98.0603.

(c) **Unfinished Buildings or Structures.** Whenever the Department determines by inspection that work on any building or structure for which a permit has been issued and the work

INVESTIGATION FEES (REPRINT FROM ARTICLE 6, CHAPTER 9, LOS ANGELES MUNICIPAL CODE)

Sec. 98.0402 — INVESTIGATION AND COLLECTION FEES REQUIRED

(a) **Investigation Fee Required.** Whenever any work has been commenced without authorization by a permit or application for inspection, as required by the provisions of Chapter IX of this Code, a special investigation shall be made prior to the issuance of the permit or application for inspection and an investigation fee of \$50.00 shall be collected on each permit or application for inspection so investigated.

EXCEPTION: When a single order to comply is written for unauthorized work in a one- or two-family dwelling, or a building or structure accessory thereto, and the unauthorized work involves more than one Article of Chapter IX, a single investigation fee of \$25.00 shall be collected.

The payment of the investigation fee shall not exempt any person from compliance with the provisions of the Code nor from any penalty prescribed by law.

started thereon has been suspended for a period of 180 days or more, the owner of the property upon which such structure is located, or other person or agent in control of said property, upon receipt of notice in writing from the Department so to do, shall within 90 days from the date of such written notice, obtain a new permit to complete the required work and diligently pursue the work to completion, or shall remove or demolish the building or structure within 180 days from the date of the written notice.

(d) Refund of Permit Fees. No claim for refund of building permit fees or grading permit fees shall be allowed in whole or in part unless filed with the City Clerk within 12 months from the date of payment or within 12 months from the date of expiration of any extensions granted pursuant to the provisions of subsection (b) of this section.

Insofar as the provisions of this subsection are in conflict with the provisions of Sections 22.12 and 22.13 of this Code, the language of this subsection shall be construed to control and supersede the language of said sections as to any such conflict.

SEC. 91.0207 — PLANS AND SPECIFICATIONS

(a) Site Plat. A plat of the site shall be filed with each application for a permit.

EXCEPTION: The Superintendent of Building may grant the omission of a Site Plat when the proposed work is of such a nature that no information is needed to determine compliance with all laws relating to the location of buildings or occupancies.

With respect to the site the plat shall show the boundaries, lot lines, existing and proposed buildings and structures, neighboring public ways, and sufficient dimensions and other data to enable the Department to determine compliance with all laws relating to the location of buildings or occupancies.

(b) Number of Sets of Plans. Each application for a permit shall be accompanied by two sets of plans and specifications.

The number of sets of plans and specifications submitted with each application for a building permit may comply with the regulations of Subsections (b) and (c) of Section 91.0209 of this Code. When the work is in a branch office, all applications except those for residential construction shall be accompanied by one additional set of plans.

EXCEPTION: The Superintendent of Building may waive the requirement for plans and specifications as required in this Article if he finds that the information on the application is sufficient to show that the work will conform to the provisions of this Code and other relevant laws.

SEC. 91.0208 — APPLICATIONS FOR PLAN CHECKING

Plans and specifications filed with this Department for checking shall be accompanied by an Application for Plan Checking on a form furnished by the Department.

SEC. 91.0209 — PLAN CHECKING FEES

(a) Fees Required. Before formally accepting a set of plans and specifications for checking, the Department shall collect a plan checking fee.

The plan check fee for buildings, structures or portions thereof shall be equal to 85 percent of the building permit fee determined in accordance with Section 91.0204.

EXCEPTION: Where the occupancy of a residential building or portion thereof is changed, the plan checking fee shall be based on a valuation equal to 85 percent of the replacement value of the portion changed.

The fee for grading plans shall be 65 percent of the grading permit fee as indicated by Section 91.0204(e). The fee for grading work on two or more contiguous sites may be the amount in-

licated for the sum of the total cubic yards in all of the separate sites.

EXCEPTION: *A grading plan check fee will not be required for jobs of 50 cubic yards or less.*

The Department shall collect a grading pre-inspection fee of \$30.00 for all grading plans and for any plan involving work to be done in the Hillside Grading Area.

EXCEPTION: *The grading pre-inspection fee may be waived when the Department determines that the nature of the work does not require pre-inspection of the worksite.*

TABLE NO. 2-C—REPEALED

(b) **Plans for More than One Building.** When two or more buildings are to be erected on the same site and the following regulations are complied with, the plan checking fee, if of a lesser amount, may be the fee indicated for the sum of the values of all the separate buildings.

1. All of the buildings shall be shown on the one set of plans and specifications;

2. Applications for separate permits for each building shall be filed prior to the checking of the plans;

3. Two sets of plans and specifications shall be submitted to the Department.

(c) **Plans for Duplicate Buildings.** When two or more buildings are to be erected from identical plans and specifications and the following regulations are complied with, the plan checking fee, if of a lesser amount, may be the fee indicated for the sum of the values of all the separate buildings.

1. Applications for separate permits for each building shall be filed prior to the checking of the plans;

2. A site plat shall accompany each application for a permit;

3. The number of sets of plans and specifications submitted to the Department shall be one more than the number of applications for permits;

4. Footings for one or more of the buildings may deviate from the plans and specifications provided that, in each instance, separate footing plans are submitted to the Department for checking and a separate permit is secured as specified in (d) of this Section.

(d) **Rechecking Plans.** No additional fee shall be charged for checking corrections required by the Department or other departments.

When plans are submitted with an application for a permit for changes from previously approved plans, the plan checking fee in the case of a building permit shall be based upon the value of all members or portions redesigned without deduction for any members replaced or omitted, and in the case of a grading permit shall be based upon the number of cubic yards involved in any work not previously approved, without deduction for any work replaced or omitted.

When a permit expires by limitation and the work is not completed, the plans shall be resubmitted for checking before the issuance of a new permit. The plan checking fee shall be based upon the same valuation as specified for the permit in Section 91.0206 (Expiration of Permits).

(e) **Time Limit for Securing Permits.** Permits shall be secured within the time limit specified in Section 98.0604.

RULE OF GENERAL APPLICATION #15-69 APPLIES. SEE APPENDIX LISTING.

SEC. 91.0210 — INFORMATION AND CERTIFICATION REQUIRED ON PLANS AND SPECIFICATIONS

(a) **General.** All plans and specifications submitted to the Department for checking shall be drawn with ink or indelible pencil, or shall be made by a reproduction process approved by the Superintendent of Building. The first sheet of each set of

plans and specifications shall give the street address of the work and the name and address of the owner of the building.

The plans and specifications shall be of sufficient clarity to indicate the nature and extent of the proposed work and to show in detail that it will conform to the provisions of this Code and of relevant laws, ordinances, rules, regulations and orders.

In lieu of detailed specifications the Superintendent of Building may approve reference on the plans to a specific Section, Subsection or paragraph of this Code, or other ordinance or law.

Distances and dimensions on the plans when required to show conformity with the provisions of this Code, shall be shown in figures.

(b) **Written Records of Computations Required.** When a structural design is required for the purpose of obtaining a permit, it shall be justified by a written record of computations filed with the Department and each sheet of the drawings and written record of computations shall be signed by or bear the approved stamp of an engineer or architect licensed by the State of California for the type of service performed. On structures which do not require engineers or architects signatures according to Article 3, Chapter 7 of the State Civil and Professional Engineers Act but do require some structural design, the person responsible for such design shall sign the calculations and the sheets of the plans having engineering details thereon.

RULE OF GENERAL APPLICATION #6-68 APPLIES. SEE APPENDIX LISTING.

(c) **Structural Engineering Plans.** For buildings exceeding 160 feet in height, each sheet of the structural calculations and structural plans shall be prepared under the supervision of and shall bear the signature or approved stamp of a person authorized to practice structural engineering by the State of California. In addition all architectural sheets shall bear the signature or approved stamp of an architect licensed by the State of California.

SEC. 91.0211 — APPROVAL AND ISSUANCE OF PLANS

(a) **General.** Permits issued under the requirements of this Code shall not relieve the owner of responsibility for securing required permits for work to be done which is regulated by any other Code, Department or Division of the City of Los Angeles.

(b) **Official Stamp.** When the plans and specifications fully comply with the provisions of Section 91.0210 (Information Required on Plans) the Department shall affix an official stamp of approval to each sheet of each set, and, upon payment of the permit fee, shall issue one set to the applicant.

(c) **Validity of Approval.** The stamping or approval of any plans or specifications shall not be held to permit, or to be an approval of the violation of any provision of this Code.

(d) **Alterations to Stamped Plans.** No stamped or approved plans or specifications shall be altered in any manner, except when and as approved by the Department.

(e) **Stamped Plans on Job.** The stamped set of plans and specifications issued to the applicant shall be kept at the site of the construction or work, and shall be available to the authorized representative of the Department. There shall be no deviation from the stamped or approved application, plans, or specifications without official approval.

(f) **Retention and Maintenance of Approved Plans.** ➤ The duplicate plans and specifications of every building or structure shall be stamped and retained by the Department for at least three months after completion of the final inspection, in the case of work requiring a building permit, or after issuance of a grading certificate, in the case of work requiring a grading permit.

In addition, after completion the Department shall permanently maintain a copy of the approved plans of every building, during the life of such building.

EXCEPTIONS: 1. Plans for the following need not be maintained.

A. Single or multiple dwellings not more than two stories and basement in height.

B. Garages and other structures appurtenant to buildings described in Subdivision A of this Exception.

C. Farm or ranch buildings.

D. Any one-story building where the span between bearing walls does not exceed 25 feet. The exemption to this Exception does not, however, apply to a steel frame or concrete building.

2. The Department will not maintain plans for any building in which a bank, other financial institution or public utility occupies more than 50 percent of the building.

Plans and specifications for grading which, in the opinion of the Superintendent of Building, are of sufficient importance shall be retained permanently by the Department without fee. <

(g) Inspection and Reproduction of Retained Plans.

> 1. **Inspection of Plans.** The copy of the approved building plans maintained by the Department as provided by Section 91.0211(f) of this Code shall be available for inspection only on the premises of the Department.

EXCEPTION: Plans or portions of plans for banks, other financial institutions or public utilities which are maintained by the Department may not be inspected without written permission from the owner of the building.

2. **Reproduction of Plans.** Plans maintained by the Department under Section 91.0211(f) of this Code may not be duplicated in whole or in part except with the written permission of the certified, licensed or registered professional or his successor, if any, who signed the original documents and the written permission of the owner of such building; or by order of a proper court.

Grading plans which are on file with the Department are public records and may be duplicated.

The fees specified in either paragraphs A or B of this subdivision shall be collected by the Department from the person requesting duplication of plans:

A. Building plans that have not been microfilmed and which are authorized for reproduction and grading plans which are to be duplicated by other than City services will be released only to a bonded duplicating service which has posted a bond for the benefit of the City of Los Angeles in an amount at least as large as the value of the plans.

The cost of duplication of such plans shall be paid directly to the duplicating service by the persons requesting such duplication. The Department shall collect a service fee of \$10.00 for each set of plans released to a bonded duplicating service as herein provided.

B. Building plans that have been microfilmed and which are authorized for reproduction shall be duplicated by City services. The Department shall collect an initial service fee of \$5.00 for each request for reproduction of plans plus a fee of \$0.70 for each sheet requested to be photocopied. <

SEC. 91.0212 — SOILS ENGINEERING, FOUNDATION INVESTIGATION, GEOLOGY, AND SOILS GEOLOGY-SEISMOLOGY REPORTS PROCESSING FEES

A fee shall be charged for the process of each soil, foundation investigation, geology report, or soils-geology-seismology report filed with the Department for deviation or approval. The amount of the fee shall be as shown in the following table:

Foundation Investigation	\$100.00
Soils Engineering Report	100.00
for the first 100 lots plus \$1.00 for each additional lot with a maximum fee of \$200.00	
Geology Report	100.00
for the first 100 lots plus \$1.00 for each additional lot with a maximum fee of \$200.00	
Soils-Geology-Seismology Report	100.00
Combined Soils Engineering and Geology Report	150.00
for the first 100 lots plus \$1.50 for each additional lot with a maximum fee of \$300.00	
Supplemental Foundation Investigation Soils Engineering, Geology, or Soils-Geology-Seismology Report	25.00
Supplemental Combined Soils Engineering and Geology Report	37.50

DIVISION 3 — ADMINISTRATION

Enforcement

SEC. 91.0301 — POWERS OF DEPARTMENT AND BOARD

The powers of the Department and the Board are enumerated in Section 98.0403 of the Los Angeles Municipal Code.

SEC. 91.0302 — INSPECTIONS (Repealed)

SEC. 91.0303 — NEW MATERIALS AND METHODS OF CONSTRUCTION

New or alternate materials and methods of construction may be approved by the Department in accordance with the provisions of Article 8, Chapter 9, of the Los Angeles Municipal Code.

SEC. 91.0304 — APPEALS

Appeals or requests for slight modifications in individual cases from the requirements of this Code shall be made in accordance with the procedures established in Section 98.0403 of the Los Angeles Municipal Code.

SEC. 91.0304.1 — HOUSING ADVISORY AND APPEAL BOARD

(a) The Board of Building and Safety Commissioners shall establish a Board of Examiners known as the Housing Advisory and Appeal Board.

(b) The Housing Advisory and Appeal Board shall be composed of five qualified persons appointed by the Board of Building and Safety Commissioners. Such appointments shall be subject to the approval of the City Council by a majority vote.

(c) Each member of the Housing Advisory and Appeal Board shall be paid > \$25.00 per meeting attended, but not to exceed \$250.00 < in any one calendar month.

(d) The members of the Housing Advisory and Appeal Board shall be exempt from all Civil Service provisions.

(e) Each member of the Housing Advisory and Appeal Board shall serve at the pleasure of the Board of Building and Safety Commissioners. Each member of the Housing Advisory and Appeal Board shall serve for a period of one year unless sooner relieved. A member of the Housing Advisory and Appeal Board may be relieved at any time by a majority vote of the Board of Building and Safety Commissioners, subject to the approval of the Council by a majority vote. A member of the Housing Advisory and Appeal Board may be reappointed by the Board

SPECIAL NOTICE ON APPEALS

Section 98.0403 of the Los Angeles Municipal Code, entitled "Appeals," calls forth important additional bases concerning appeals to rulings of the Department of Building and Safety. Please refer to Appendix section of this book for copy of this section.

of Building and Safety Commissioners, subject to the approval of the Council by a majority vote. The Council may at any time, upon its own motion, remove any member therefrom when approved by not less than a two-thirds vote of the said Council.

(f) The Housing Advisory and Appeal Board shall serve in an advisory capacity to the Board of Building and Safety Commissioners on all matters concerning housing and will conduct any investigations directed by the Board of Building and Safety Commissioners.

(g) The Housing Advisory and Appeal Board shall consider all appeals and protests which concern housing and all matters referred to it by the Board of Building and Safety Commissioners.

(h) The Housing Advisory and Appeal Board shall submit in writing to the Board of Building and Safety Commissioners its findings and recommendations on all matters considered by it.

(i) Each member of the Housing Advisory and Appeal Board shall have power to administer oaths and require the City Clerk to issue subpoenas; failure to appear or testify in response to any subpoena or to produce any item under subpoena "*duces tecum*" shall be punished as a misdemeanor; the City Clerk shall cause such subpoenas to issue under the seal of the City, and the Chief of Police shall cause such subpoenas to be served.

The City Attorney, or an assistant or deputy designated by him, shall appear at the request of the Housing Advisory and Appeal Board at any hearing before that Board.

SEC. 91.0304.2 — ENGINEERING GEOLOGY ADVISORY COMMITTEE

(a) Function of the Committee. It shall be the function of the Engineering Geology Advisory Committee to advise and counsel the Board on appeals involving technical questions of soils engineering, geology, ➤ geology/seismology,◀ and related matters.

(b) Establishment of the Committee Member List. The Board of Building and Safety Commissioners shall establish an Engineering Geology Advisory Committee Member List (hereinafter in this section referred to as the "Committee Member List") which shall consist of not less than 10 soils engineers (see Division 30) and engineering geologists who are available to serve as members of the Engineering Geology Advisory Committee. ➤ At least two of the engineering geologist members and two of the soils engineer members shall have experience in the field of seismic design and safety.◀ Members of said committee shall be exempt from all Civil Service provisions.

(c) Procedure. When an appeal is made to the Board, ➤ and the Board determines that the subject of the appeal involves a problem of soils engineering, geology, geology/seismology or a related matter on which it desires further technical advice before it renders a decision thereon, the Board may select three or more persons from the Engineering Geology Advisory Committee Member List to serve on a committee for the purpose of assistance to the Board in seeking a solution to said problem, and may refer the matter to such committee members for report and recommendation.◀ At least one member of the committee so designated shall be a soils engineer and one shall be an engineering geologist. The members of the committee so meeting shall review the matter and shall then submit to the Board a recommendation. When a matter is referred to the committee as in this section provided, the Board shall consider, but is not bound to accept, the recommendation of the committee.

(d) Compensation of Members. Each member of the committee who is in actual attendance at a meeting requested by the Board shall be compensated at the rate of \$50.00 for each four hours or fraction thereof of service. However, in no case shall the compensation of the committee members exceed the fee paid by the appellant under subsection (f) of this section.

(e) Self-insurance by the City for Committee Members. The

provisions of sections 11.36 through 11.44, inclusive, City of Los Angeles Administrative Code, entitled "Self-Insurance by the City for Officers and Employees of Said City," shall apply to each Engineering Geology Advisory Committee Member while he is acting as such and committee members shall be deemed to be fully covered by the provisions of said sections even though each committee member is retained as an independent person and not as an officer or employee of the City.

(f) Fees. When a matter is referred to the committee as provided in this section, the appellant in said matter shall pay a referral fee of \$25.00 and shall also pay a fee as follows:

1. Where no more than two lots are involved in the appeal, \$150.00;

2. Where not less than three nor more than 10 lots are involved in the appeal, \$300.00;

3. Where more than 10 lots are involved in the appeal, \$600.00.

SEC. 91.0304.3 — Repealed.

SEC. 91.0305 — AUTHORITY TO STOP WORK

Whenever any construction or work is being done contrary to the provisions of any law or ordinance enforced by the Department, the Superintendent of Building shall issue a written notice to the responsible party to stop work on that portion of the work on which the violation has occurred. The notice shall state the nature of the violation and no work shall be done on that portion until the violation has been rectified and approval obtained from the Department.

SEC. 91.0306 — AUTHORITY TO REQUIRE EXPOSURE OF WORK

Whenever any work on which called inspections are required, as specified in Section 91.0309, is covered or concealed by additional work without first having been inspected, the Superintendent of Building shall require, by written notice, that such work be exposed for examination. The work of exposing and re-covering shall not entail expense to the City.

SEC. 91.0307 — AUTHORITY TO STOP USE OR OCCUPANCY

Whenever any portion of a building is loaded in excess of the loading for which it was constructed, or whenever it houses an occupancy other than that for which it was constructed, or whenever there is an encroachment upon any required court or yard, the Superintendent of Building shall order, by written notice, that such violation be discontinued.

The written notice shall state the nature of the violations and shall fix a time for the abatement thereof. If the violations have not been abated by the expiration of the fixed time, the Certificate of Occupancy shall thereupon be null and void.

SEC. 91.0308 — AUTHORITY TO CONDEMN BUILDINGS OR PROPERTY

(a) Order to Vacate. Whenever the Superintendent of Building finds that any building or structure or any portion thereof, or any device, appliance, apparatus, equipment, appendage or ornamentation thereon has become a menace to life or limb, health or safety, as defined in Section 91.0103, or has become a sub-standard residential building or a residential building subject to repair as defined in Section 91.4902 or is from any cause in

such a dangerous or unsafe condition as to constitute an imminent hazard to the extent that persons in or around such building or structure are in constant and serious jeopardy of life or limb, he shall, by written order delivered personally or mailed to the occupant of said building at the address thereof, direct that said building be, by a time specified in said order, restored to a condition of stability and safety, or demolished. Said order shall require that such building be vacated within a reasonable time, to be specified in the order, and in case of extreme and immediate danger, said order may specify immediate vacation. No person shall use or occupy any such building or structure from and after the date on which the same has been ordered vacated, until said building shall be restored to a condition of stability and safety as required by said order and a new Certificate of Occupancy issued, and any Certificate of Occupancy theretofore issued for such building or structure shall be void.

(b) **Posting of Warning.** Warning placards declaring the building to be unsafe for occupancy shall be conspicuously posted near the entrances to every building ordered vacated by the Superintendent of Building pursuant to Subsection (a) of this Section. Such placards shall contain the statement, "To deface, cover, hide from view, or remove this placard is in violation of the Los Angeles Municipal Code."

Any warning placard posted pursuant to this section shall not be defaced, covered, removed, or hidden from view in any manner.

(c) **Barricades.** Where a building ordered vacated according to Subsection (a) of this Section presents an imminent danger to life because of public access thereto, the Superintendent of Building may request the Board of Public Works to erect the necessary barricades, as described in the request, so as to prevent public access to the building or premises. The necessary barricades shall be erected by the Board of Public Works upon receipt of the request from the Superintendent of Building.

(d) **Removal or demolition without notice.** Notwithstanding anything to the contrary in this section, whenever the Superintendent of Building determines that a building or structure or any portion thereof or any device, appliance, apparatus, equipment, appendage or ornamentation thereon as referred to in Subsection (a) of this section, is a present, imminent, extreme and immediate danger to life or limb, health or safety, so as to necessitate the immediate elimination thereof without prior notice to the owner, he may without an order or notice of any kind whatsoever and without a hearing cause the building or structure or any portion thereof or any device, appliance, apparatus, equipment, appendage or ornamentation to be immediately removed or demolished by such means as he may deem advisable. The Superintendent of Building may request the Board of Public Works to cause the building or structure or any portion thereof or any device, appliance, apparatus, equipment, appendage and ornamentation to be immediately removed or demolished. The removal or demolition shall be accomplished by the Board of Public Works upon receipt of the request from the Superintendent of Building. Where the work is accomplished by other than City forces, the cost thereof shall be paid from the "Repair and Demolish Fund" as established in Section 96.120 of the Municipal Code. In all cases, the costs incurred by the City in securing the removal or demolition of the building or structure or any portion thereof or any device, appliance, apparatus, equipment, appendage or ornamentation shall be assessed against the property upon which the particular building or structure or any portion thereof or any device, appliance, apparatus, equipment, appendage or ornamentation is located in accordance with the provisions of Section 96.120.1 and 96.121 of the Municipal Code. The proceeding for assessment of such cost shall

be in accordance with Sections 96.119, 96.119.1, 96.120.1 and 96.121 of the Municipal Code.

(e) **Unstable Property.** Whenever the Superintendent of Building determines by inspection that a property, either improved or unimproved, is unstable because of landslide, subsidence or inundation he shall give written notice to the owner that the property is substandard. Notice shall specify conditions creating substandard classification.

At the time of giving the above mentioned notice, the Superintendent of Building shall also file with the office of the County Recorder a certificate that the property is substandard and that the owner thereof has been so notified. The certificate shall specify conditions creating substandard classification.

Upon notice of correction of the unstable conditions due to landslide, subsidence or inundation the Superintendent of Building shall file with the office of the County Recorder a certificate specifying that the property is no longer considered substandard due to landslide, subsidence or inundation.

SEC. 91.0309 — INSPECTION

(a) **General.** All construction or work for which a permit is required shall be subject to inspection by authorized employees of the Department, and certain types of construction shall have continuous inspection by Registered Deputy Building Inspectors, as specified in Section 91.0310. Prior to the issuance of a Certificate of Occupancy as specified in Section 91.0315, a final inspection shall be made by the Department of all construction or work for which a permit has been issued.

(b) **Called Inspections.** The permittee or his agent shall notify the Superintendent of Building when the building or portion thereof is ready for each of the following inspections:

1. **Foundations:** When the excavation for footings is complete and footing forms and required reinforcing steel are in place, but before any concrete is placed;

2. **Wood Framing, Ventilation Equipment Installation:** When all roof, walls and floor framing, firestopping and bracing are complete and all pipes, chimney, vents and duct work is in place, but before any of this work is covered;

3. **Thermal Insulation for Dwellings or Residential Structures:** When all thermal insulation is installed in required wall and attic spaces, but before any of this work is concealed;

4. **Plaster:** When the backing and lath are in place ready for plaster or stucco;

5. **Reinforced Concrete:** When forms and reinforcing steel are in place ready for concrete;

6. **Reinforced Masonry:** In grouted masonry when vertical reinforcing steel is in place and other reinforcing steel distributed and ready for placing, but before any units are laid up;

7. **Structural Steel:** When structural steel members are in place and required connections are complete, but before concealing any members or connection;

8. **Final:** When the construction or work is completed and the structure ready for occupancy, but before being occupied.

Notification shall be given to the Department on the day prior to the day on which inspection is desired.

The Department shall approve that portion of the work inspected or notify the responsible person wherein it fails to comply with the law. Any portions which do not comply with the law shall be corrected and no such portion shall be covered or concealed with additional work until approved.

When any of the above required inspections has been made and that portion of the work approved, the inspector shall so record on the permit card posted on the job.

(c) **Lot Surveys.** In the absence of any designation of the proper location of the lot on which a building is to be erected, for which building a permit has been issued, the Superintendent of Building may require the owner to have the lot surveyed and staked by a Registered Land Surveyor or Registered Civil Engineer so that the proper location of the building on the lot may be determined.

(d) **Other Inspections.** In addition to the called inspections specified above, the Superintendent of Building may make any other inspections of any construction work to ascertain compliance with the provisions of this Code and other laws which the Department enforces.

(e) **Approved Fabricators.** The inspections provided for in this section shall not be required for construction or installation work done on the premises of a Type II Fabricator to whom an approval has been issued pursuant to the provisions of Division C of Article 6 of Chapter IX of the Los Angeles Municipal Code.

(f) **Inspection of Excavation and Fills.** The permittee or his agent shall notify the Superintendent of Building when the grading operation is ready for each of the following inspections:

1. **Initial Inspection:** When the permittee is ready to begin work, but before any grading or brushing is started.

2. **Toe Inspection:** After the natural ground is exposed and prepared to receive fill, but before any fill is placed.

3. **Excavation Inspection:** After the excavation is started, but before the vertical depth of the excavation exceeds ten feet.

4. **Fill Inspection:** After the fill emplacement is started, but before the vertical height of the lifts exceed ten feet.

5. **Drainage Device Inspection:** After forms and pipe are in place, but before any concrete is placed.

6. **Rough Grading:** When all rough grading has been completed. This inspection may be called for at the completion of the rough grading without the necessity of the Department having previously reviewed and approved the reports.

7. **Final:** When all work, including installation of all drainage structures and other protective devices, has been completed and the as-graded plan and required reports have been submitted.

The permittee need not wait for the inspector to arrive before proceeding with the work after the inspection required by Subdivision 2 of this subsection has been completed.

The Department shall immediately approve the work inspected or notify the permittee or owner wherein it fails to comply with the law. Any portion of the work which does not comply with the law shall be corrected.

(g) **Revised Grading Plan.** If the inspector finds that the soil or other conditions are not as stated in the application for a grading permit, he may refuse to approve further work until a revised grading plan is obtained which conforms to the existing conditions.

SEC. 91.0309.1 — BUILDING MATERIALS — INSPECTION REQUIRED

(a) No person shall use or cause to be used, in the construction of any building or structure for the erection of which a

permit is required by this Chapter, any materials which are not specifically permitted by this Code, without having first secured the approval of said materials by the Department.

(b) The Department may require that all materials to be used in the construction of any building or structure, or materials already used or fabricated into a building or structure, be submitted for test to a testing agency approved by the Department.

(c) It is unlawful for any person to fail to submit to an approved testing agency within five days after having received a written notice from the Department a sample, sufficient for analysis, of any material to be used in the erection or construction of a building or structure or which has been used or fabricated into a building or structure.

(d) No material required by the Department to be submitted to a testing agency for analysis shall be approved by the Department unless the person requesting said approval submits a written report of the analysis by such testing agency.

SEC. 91.0310 — SPECIAL INSPECTIONS

(a) **Engineering Inspections.** In addition to the inspections to be made by employees of the Department, as specified in Section 91.0309, the architect or engineer in responsible charge of the design of the structure shall provide, via a Registered Deputy Building Inspector, continuous inspection under the following conditions:

1. For use of higher stresses in:
 - A. Reinforced concrete work.
 - B. Reinforced masonry work.
 - C. Welded steel work.
2. Under all conditions with the use of:
 - A. High strength bolts.
 - B. Pneumatic mortar.
 - C. Class B reinforced gypsum concrete.
 - D. Concrete elements precast at other than the job site.

EXCEPTIONS: 1. The Department may waive continuous inspection where minor quantities are involved and no unusual hazards exist.

2. If the Department finds that no unusual hazard exists, it may waive the requirement for continuous inspection on any building or structure, provided the unit stresses used in design do not exceed those allowed elsewhere in this Code for work not continuously inspected.

The Registered Deputy Building Inspector shall be approved by and shall be responsible to the architect or engineer in responsible charge of the design of the structure.

(b) **Certifications by Architect or Engineer.** If a structure or portion thereof has been designed to utilize higher stresses requiring continuous inspection, the architect or engineer in responsible charge of such a design shall certify by signature to the Department that to the best of his knowledge the structure, or portion thereof utilizing higher stresses, was constructed in conformity with the approved design.

(c) **Department's Responsibility.** The employment of a Registered Deputy Building Inspector on any work shall not be deemed to relieve the Department of responsibility for such inspection or of the periodic and called inspections of all portions described in this Subsection. On any work requiring continuous

inspection by a Registered Deputy Building Inspector the called inspections required by Section 91.0309(b) may be delegated to the Registered Deputy Building Inspector by the Superintendent of Building.

(d) Repealed.

(e) Structural, Termite, and Fungus Damage. Every building raised from its foundation shall be inspected. If there is any superficial evidence of structural damage, the existence of termites, or fungus growth, the permittee shall remove and renew the damaged or infested members before reseating the building or before moving it from its existing site or into the City.

(f) Emergencies or Catastrophes. In the event of an emergency or of a major catastrophe in the City, the Department may deputize emergency Building Inspectors for the Department. These inspectors shall receive no compensation from the City, and they shall be appointed for such periods of time as the Department may deem advisable.

(g) Approved Fabricators. The special inspections provided for in this section, except those set forth in Subsection (i) hereof, shall not be required for the work done on the premises of a Type I Fabricator to whom an approval has been issued pursuant to the provisions of Division C of Article 6 Chapter IX of the Los Angeles Municipal Code.

(h) Structural Inspection — Concrete. During the construction of all buildings over 160 feet in height with concrete ductile moment-resisting space frames, a Structural Inspector, under the supervision of the engineer responsible for the structural design, shall be present to inspect the materials and workmanship for conformance with approved plans, specifications, and change orders involved in construction of the ductile frames and shear walls. Such inspection may be made by one or more Structural Inspectors provided that at least one Structural Inspector is present during the placement of all concrete and reinforcement in the structural frame and shear walls.

The number of Structural Inspectors to be provided for each structure shall be determined by the engineer responsible for the structural design, provided that more than one Structural Inspector shall be provided where the magnitude of a structure prevents a single inspector from adequately performing the inspection.

The owner shall provide for each Structural Inspector. Each Structural Inspector shall be paid by the owner directly or through the person responsible for the structural design. Each Structural Inspector shall be responsible to the person who prepared the structural design.

The inspection by the Structural Inspector or Inspectors shall be in addition to inspections made by Department employees as specified in Section 91.0309 and by Registered Deputy Building Inspectors as specified for other parts of the work in Section 91.0310(a).

Prior to the issuance of the Certificate of Occupancy each Structural Inspector shall submit a report in writing to the engineer and the Department certifying that the portions of the structural frame inspected by him were constructed in accordance with the approved plans, specifications, change orders, and Division 26 of the Code.

(i) Structural Inspection — Steel. During the fabrication and erection of buildings over 160 feet in height with structural steel moment-resisting space frames, a Registered Deputy Building Inspector, under the supervision of the engineer responsible for the structural design, shall be present during the performance

of all structural welding or the installation of all high-strength bolts whether in a fabricators shop or at the job site.

(j) **Certification.** For buildings exceeding 160 feet in height the engineer responsible for the structural design, and the general contractor responsible for the construction, or their competent authorized representatives, shall make periodic inspections of the work at the site to verify general compliance with the approved plans, specifications and change orders. The engineer and general contractor shall submit a statement in writing to the building department stating that they know from personal knowledge that the materials installed and the structural work performed is in compliance with the approved plans, specifications and change orders.

The phrase "personal knowledge" as used above in reference to the engineer and general contractor is interpreted to mean the personal knowledge which is the result of such general observation by the engineer and general supervision by the contractor of the work as is required of and accepted from both the engineer and general contractor in the superintendence of construction of the building and as distinguished from the continuous personal superintendence of the special inspector and/or deputy inspector who are continuously at the site during the progress of the work. The exercise of reasonable diligence to obtain the facts is required and anyone who intentionally remains ignorant may be charged with knowledge. The interpretation of "personal knowledge" as it applies to the special inspector and/or deputy inspector is that he/they must have actual personal knowledge that the requirements of the plans and specifications are being carried out, obtained by his/their continuous observation of the work of construction at the site in all stages of its progress.

SEC. 91.0311 — REGISTERED DEPUTY BUILDING INSPECTORS

(a) **Registration.** 1. Application for registration as a Registered Deputy Building Inspector shall be made to the Superintendent of Building on a form furnished by the Department, and a separate application shall be made for each type of registration desired.

2. A committee appointed by the Superintendent of Building shall examine each applicant as to his experience and training for performing the duties of an inspector of the type for which he has applied. When satisfied as to the fitness of the applicant, the Superintendent of Building shall issue to him a Certificate of Registration. Upon application for a renewal of a Certificate of Registration, the applicant shall be re-examined to ascertain his fitness to perform the duties of inspector of the type for which he has applied.

3. The Superintendent of Building shall issue separate certificates for each of the following types of inspectors: reinforced concrete, reinforced masonry and structural welding. Nothing herein shall be deemed to prohibit any one person from being qualified for more than one type of inspection, provided he makes application, pays the required fees, takes the required examinations and is duly qualified by the Superintendent of Building for each type.

4. Each Certificate of Registration shall expire three years from the date of issuance, but may be renewed by the Superintendent of Building within a grace period of 30 days thereafter.

5. The Superintendent of Building shall keep on file in his office a current classified list, open to public inspection, of the

names of all Registered Deputy Building Inspectors, showing the type of work each has been authorized to inspect.

6. Upon evidence, satisfactory to the Superintendent of Building, of incompetence, of willful or negligent failure to observe or report violations of this Code or of any other failure to perform properly and effectively the duties assumed by a Registered Deputy Building Inspector, the Superintendent of Building may revoke, suspend, or refuse to renew any Certificate of Registration, but prior to such action, the holder shall be given an opportunity to appear before the Superintendent of Building and be heard.

7. Except where there is an employee of the City of Los Angeles inspecting buildings or structures being erected or repaired by the City, no Registered Deputy Building Inspector shall receive any compensation whatsoever from the City. He shall undertake and perform the duties of inspection solely upon the request of the owner or his agent. Such designation shall be deemed to determine that his duties incident to such inspection are within the course and scope of his employment by such owner or agent; and except where he is in fact an employee of the City, as aforesaid, he shall not be deemed an employee of the City, the contractor, a subcontractor or a material vendor for any purpose.

(b) **Duties.** 1. The Registered Deputy Building Inspector employed on any work must be present during the prosecution of all the work he has undertaken to inspect. He shall notify the Department of his commencement of inspection of a job and shall specify the type of inspection for which he has been engaged. This notification shall be made no later than the last working day preceding such commencement of inspection. He shall report to the job sufficiently in advance of construction to familiarize himself with the plans and to inspect all materials to be used or concealed within such work; he shall inspect the construction, erection, placing, or other use of such materials; and he shall observe whether there is compliance with this Code as to all of the foregoing. During the prosecution of the work, he shall not undertake or engage in any other task or occupation which will interfere with the proper performance of his duties of inspection. He shall report, as directed, to the Superintendent of Building, noting all violations of this Code which have occurred and such other information as may be required. At the conclusion of his duties on any project which has been completed in accordance with this Code, he shall submit a report to the Department setting forth the portion of the work he inspected. The report shall be made on forms supplied by the Department and shall be filed in the records of the Department.

2. Nothing herein shall be deemed to authorize any Registered Deputy Building Inspector to approve the pouring of concrete or the placement of masonry or structural steel prior to the approval of the soil condition by the regular Building Inspector.

3. Where, in the opinion of the Department, the magnitude or complexity of a job is sufficient to warrant, additional Registered Deputy Inspectors may be required.

4. Where, in the opinion of the Department, the Registered Deputy Inspector is negligent in the performance of his duties, the job shall be stopped.

(c) **Fees.** 1. Before accepting an application for registration as a Registered Deputy Building Inspector, the Department shall collect an examination fee of \$62.50. An additional registration fee of \$37.50 shall be collected when the applicant successfully passes the examination. Each type of inspection shall require a separate application and fee. An additional fee shall be

collected for each additional examination, and each additional registration.

2. Before renewing a Certificate of Registration as Deputy Building Inspector, the Department shall collect a renewal fee in the amount of \$35.00 for each type of registration to be renewed and, in addition, a re-examination fee in the amount of \$45.00 for each type of registration.

(d) Failure to Pass Examination.

1. Every applicant who fails to pass an examination shall not be eligible for another examination until 90 days after taking the previous examination. Any applicant who fails to pass upon the third trial shall not be again eligible until six months thereafter.

2. Every applicant who fails to pass a re-examination shall not be eligible for another re-examination until 30 days after taking the previous examination.

RULE OF GENERAL APPLICATION #18-68 APPLIES. SEE APPENDIX LISTING.

SEC. 91.0311.1 — STRUCTURAL INSPECTORS

(a) **Qualifications.** Each Structural Inspector selected by the engineer shall have at least five years experience in the design or inspection of reinforced concrete buildings, shall have a thorough knowledge of the quality control of concrete and placement, and shall be able to interpret the structural drawings and specifications. The Department shall be notified in writing of each selection by the engineer.

(b) **Department Acceptance.** Each Structural Inspector selected by the engineer to perform the inspection shall make application to the Department for acceptance. The Department shall examine each applicant and his experience record to confirm his qualifications to perform the structural inspections required by Subsection 91.0310(h) of this Code and shall notify the engineer as to the acceptability of each applicant. Approval granted by the Department shall be effective until the issuance of the Certificate of Occupancy.

(c) **Duties.** The Structural Inspector or Inspectors required by Subsection 91.0310 (h) shall perform continuous inspection on the quality and placement of all concrete and reinforcement in the structural frame of the building. The Structural Inspector present shall not permit concrete to be placed in the forms until all preparations for its placement are complete, including preparations of surfaces, and accurate positioning of reinforcement and forms.

Each Structural Inspector shall immediately report to the engineer and the Superintendent of Building all deviations observed by him from the structural drawings, specifications, and the requirements of the Code. At the conclusion of his duties on the project he shall submit a report as required in Section 91.0310 (h).

Where a single Structural Inspector has been approved by the Department for a structure, and where, in the opinion of the Department, such Structural Inspector is negligent in the performance of his duties, or in the event that he is absent from the job during the placement of reinforcement or concrete, the job shall be suspended until another Structural Inspector has been approved for the job by the Department.

SEC. 91.0312.1 — CERTIFICATION OF WELDERS

(a) The Department shall establish rules and regulations setting forth conditions and provisions precedent to the issuance of Welder's Certifications.

A fee of \geq \$30.00 shall be paid on each application for certification or renewal and \$10.00 \leq of such fee shall be paid prior to the Departmental Examination for a new certification. Certificates shall be issued for a period of three years, and may be renewed for additional three-year periods.

(b) The Superintendent of Building shall suspend or revoke any certificate upon evidence of failure of the person so certified to conduct welding operations in compliance with any of the conditions upon which it is based, or where quality of workmanship is not equivalent to that required by the Code, or for any of the reasons set forth in Article 8 of Chapter IX of the Los Angeles Municipal Code. Any such action shall be in accordance with the provisions of Article 8 of Chapter IX of the Los Angeles Municipal Code.

SEC. 91.0313 — RESPONSIBILITY OF PERMITTEE

Building and grading permits shall be presumed to incorporate the proviso that the applicant, his agent, employees, or contractors shall carry out the proposed work in accordance with the approved plans and with all requirements of this Code and any other laws or regulations applicable thereto, whether specified or not.

No approval shall relieve or exonerate any person from the responsibility of complying with the provisions and intent of this Code.

SEC. 91.0314 — (Repealed)

SEC. 91.0315 — CERTIFICATE OF OCCUPANCY

(a) **Certificate Required.** In order to safeguard life and limb, health, property, and public welfare, every building or structure and every trailer park shall conform to the construction requirements for the Subgroup Occupancy to be housed therein, or for the use to which the building or structure or trailer park is to be put, as set forth in this Article.

No building or structure or portion thereof and no trailer park or portion thereof shall be used or occupied until a Certificate of Occupancy has been issued therefor.

EXCEPTIONS: 1. Unless it is specifically required by other provisions of this Article, no existing building or portion thereof shall require a Certificate of Occupancy, provided:

a. The occupancy housed therein is the same for which the original building permit was issued; and

b. The use of a building or portion thereof housing an A, B or S Occupancy and constructed prior to 1934 has not been discontinued for a period of more than six months.

2. No structure, the architecture of which inhibits occupancy, shall require a Certificate of Occupancy.

3. Unless required by Subsection (a-a) of this Section, one or two family dwellings shall not require a Certificate of Occupancy. Such dwellings are approved for occupancy when a final inspection certification by the Superintendent of Building is posted at the building at the completion of the final inspection.

(b) **Change of Occupancy.** Each change of occupancy to one classified in a different sub-group shall require a new Certificate of Occupancy, whether or not any alterations to the building are required by this Code.

If a portion of any building does not conform to the requirements of this Code for a proposed occupancy, that portion shall be made to conform. The Superintendent of Building may issue a new Certificate of Occupancy without stating therein that all of the requirements of the Code have been met and without

requiring compliance with all such requirements if he finds that the change in occupancy will result in no increased hazard to life or limb, health, property, or public welfare.

EXCEPTION: Any assembly occupancy in a building constructed prior to 1934 shall not be expanded or arranged to accommodate a larger number of occupants than that for which the original Certificate of Occupancy was issued unless the entire building conforms with the provisions of Division 23.

When application is made for such Certificate of Occupancy, the Superintendent shall cause an inspection of the building to be made. The inspector shall advise the applicant of those alterations necessary, or if none is necessary, shall make a Report of Compliance to the Superintendent.

Before any application for such Certificate of Occupancy is accepted, a fee shall be paid by the applicant to cover the cost to the City of the inspection of the building for which a change of occupancy is desired. The amount of the fee shall be as follows:

CERTIFICATE OF OCCUPANCY — FEE SCHEDULE	
Affected Floor Area	Fee
➤ 0 - 2500 square feet	\$185.00
2501 - 5000 square feet	285.00
5001 - 7500 square feet	330.00
7501 - 10,000 square feet	410.00
Each additional 10,000 square feet or fraction thereof	105.00<

The above application fees shall be in addition to the regular building permit fees required by Sec. 91.0204.

EXCEPTIONS: 1. The application fee indicated above may be waived when, in the opinion of the Superintendent of Building, sufficient, complete and accurate plans are filed showing clearly all structural and legal code requirements for the new occupancy.

2. The application fee indicated above shall be waived for occupancy surveys on child care facilities where the owner or operator is a non-profit child care organization that has filed a notarized affidavit to that effect with the Department.

If a new Certificate of Occupancy has not been obtained within six months after the application fee is paid, a new application shall be filed and another application fee paid for a reinspection before a Certificate of Occupancy can be issued.

➤ Any change of use within a given occupancy Subgroup in a building which is required to comply to the rules and regulations adopted by the Energy Resources Conservation and Development commission of the State of California and not requiring a building permit but which would increase the demand for energy supply shall require a new Certificate of Occupancy and shall require a fee of \$25.00. <

RULE OF GENERAL APPLICATION #657 APPLIES. SEE APPENDIX LISTING.

(c) **Issuance of Certificates.** When required by Subsection (a) of this Section, and after the receipt and approval of the final inspection report from each of the Divisions of the Department, the Superintendent of Building shall issue a Certificate of Occupancy, without charge, to the owner of the building. Duplicates of the Certificate may be secured upon the payment of the duplication fee required by ordinance.

When a Certificate of Occupancy is issued it shall supersede every Certificate previously issued for that portion of the building described thereon.

(d) **Contents of Certificate.** Each certificate shall contain the following:

1. The building permit numbers;
2. The address of the building;
3. The name and address of the owner;
4. A description of that portion of the building for which the certificate is issued;
5. For Group A, B and S Occupancies, the maximum occupant load allowed;
6. A statement that the described portion of the building complies with the construction requirements of the Los Angeles Municipal Code for the group of occupancies in which the proposed occupancy is classified;
7. The signature of the Superintendent of Building or his authorized representative.

(e) **Temporary Certificates.** Notwithstanding the provisions of Subsection (d) of this section, if the Superintendent of Building finds that no substantial hazard will result from the occupancy of any building, or portion thereof, before the same is completed, and satisfactory evidence is submitted that the work could not have been completed prior to the time such occupancy is desired because of its magnitude or because of unusual construction difficulties, he may issue a temporary Certificate of Occupancy for any building or portion thereof. In addition, the Superintendent of Building may issue a temporary Certificate of Occupancy for an existing building, or portion thereof, provided no substantial hazard will result and satisfactory evidence is submitted justifying the need for such temporary occupancy. The Department shall collect a fee of \$65.00 for each temporary Certificate of Occupancy. Such temporary Certificate of Occupancy shall be valid for a period not to exceed six months. After the expiration of a temporary Certificate of Occupancy, the building or structure shall require a Certificate of Occupancy in accordance with other provisions of this section.

Duplicates of the Certificate or temporary certificate may be secured upon the payment of the duplication fee required by ordinance.

(f) **Fire Department Notification.** For each Group A, B, and S Occupancy, a copy of the Certificate of Occupancy shall be forwarded to the Los Angeles Fire Department.

SEC. 91.0316 — CODE REVISION

(a) The Superintendent of Building shall determine what changes in the Code are necessary to more adequately protect the public health, safety and welfare, based on studies of the following:

1. Schedules of requests for deviation from the provisions of the Code and for approval of materials and methods of construction;
2. Schedules of violations of the provisions of this Code;
3. Schedules of convictions and non-convictions, and the reasons for non-convictions, by the City Attorney's office;
4. Changes and improvements in materials, methods of construction and design;
5. Investigations of fire and structural damage to buildings.

(b) Upon request, the Board shall consult with and provide advice to the Superintendent of Building on any matter relating to proposed changes of this Code.

SEC. 91.0317 — GRADING CERTIFICATE

(a) **Certificate Required.** No owner of property or other person or agent in control of property shall permit or allow any grading made after October 17, 1952, and not expressly within the exceptions set forth in Section 91.0201, to exist on such property unless a Grading Certificate has been issued therefor or unless the grading is being carried on under the authorization of a valid grading permit.

(b) **Issuance of Certificate.** If upon final inspection of any excavation or fill it is found that the work authorized by the grading permit has been satisfactorily completed in accordance with the requirements of this Code, a Grading Certificate covering such work shall be issued to the owner by the Superintendent of Building. On the owner's request a separate certificate will be issued for each lot for which building permits have been issued or applied for prior to the completion of the grading.

(c) (Repealed)

SEC. 91.0318 — INSPECTION PROCEDURES AND FEES

If the owner of an existing residential building desires to determine whether the building is in compliance with applicable sections of Chapter IX of the Los Angeles Municipal Code for existing buildings, the owner may make application to the Department for a Certificate of Housing Compliance. Before any application for such Certificate of Housing Compliance is accepted, a fee shall be paid by the applicant to cover the cost to the City for the necessary inspections and report. The amount of the fee shall be as follows:

Fee

Single-family dwelling or the first dwelling unit on the premises	> \$120
Each additional dwelling unit on the premises up to four units total	\$65 per unit
Each dwelling unit in excess of four units	\$45 per unit
Each guest room or light housekeeping room	\$30 per room <

Inspection of buildings accessory to the residential building shall be included as part of the inspection without an additional fee.

After the application has been accepted, the Superintendent shall cause an inspection to be made and a report prepared. If, after taking into account nonconforming rights, the inspection report indicates that any building or portion thereof does not conform to the requirements of Chapter IX of the Los Angeles Municipal Code, that portion shall be made to conform.

When compliance has been secured, or if no corrections are required as a result of the inspection report, the Superintendent will issue to the owner a Certificate of Housing Compliance stating that the building is now in substantial compliance with the applicable provisions of Chapter IX of the Los Angeles Municipal Code for existing buildings.

The issuance of this certificate shall not be construed by any person to be a representation, guarantee, or warranty of the premises for any purpose including, but not limited to, fitness, suitability, or freedom from defects, either latent or patent. Nor is the issuance of this certificate to be construed a waiver of any immunity provided to public entities and public employees under State law, including, but not limited to those immunities provided by Division 3.6 of Title 1 of the California Government Code.

DIVISION 4 — DEFINITIONS

SEC. 91.0401 — GENERAL

Except as defined in this Division or elsewhere in this Code, the interpretation of words used in this Code shall be in accordance with the definitions in Webster's New International Dictionary of the English Language, Unabridged, Third Edition, published in 1961.

SEC. 91.0402 — NUMERICAL DESIGNATION SYSTEM

(a) General. For the purpose of reference, all portions of this Code shall be designated as defined in Subsection (b) of this Section.

(b) Designations.

Code. All portions of the Los Angeles Municipal Code designated by the number 91 to the left of all decimal points.

Division. Portions of this Code designated by the first two digits to the right of the number 91 and separated therefrom by a decimal point.

Section. Portions of a Division of this Code designated by the two digits following the Division designation.

Subsection. Portion of a Section of this Code designated by a letter in parentheses or by decimalization.

SEC. 91.0403 — DEFINITIONS

For the purpose of this Code, certain terms are defined as follows:

(a) Words beginning with "A".

Accessory Building. A detached subordinate building, the use of which is customarily incidental to that of the main building or to the main use of the land and which is located on the same lot with the main building or use.

Addition to a Building. The result of any work that increases the volume of an existing building or replaces a demolished portion.

Alteration to Building. Any work on a building or structure that does not result in any addition to the building or structure.

Approved. Unless otherwise specifically stated, approved by the Department as provided in Article 8, Chapter 9, or by the Board in case an appeal is made to it under Article 8, Chapter 9.

Approved Plans. Plans approved and stamped by the Department of Building and Safety as provided in Section 91.0211.

Assembly Room. A room appropriated to the gathering together of persons for such purposes as deliberation, instruction, worship, entertainment, amusement, dining, or awaiting transportation.

A.S.A. American Standards Association.

A.S.T.M. The American Society for Testing and Materials.

Attic. Space between a roof and the ceiling beneath and not appropriated to any occupancy.

Auditorium. That portion of an assembly room with fixed seats, movable seats, or terraced floor.

(b) Words beginning with "B".

Balcony. Partial floor in an assembly room.

Basement. Any story below the first story of a building.

Bearing Wall. Any wall meeting either of the following classifications:

1. Any metal or wood stud wall which supports more than 100 pounds per linear foot of superimposed load.

2. Any masonry or concrete wall which supports more than 200 pounds per linear foot of superimposed load, or any such wall supporting its own weight for more than one story.

Bedrock. Bedrock shall mean the relatively solid undisturbed rock in place either at the ground surface or beneath surficial deposits of gravel, sand or soil.

Board. The Board of Building and Safety Commissioners of the City of Los Angeles.

Boiler Room. Any room containing a steam or hot water boiler.

Building. Any structure having a roof supported by columns or walls, for the housing, shelter or enclosure of persons, animals, chattels or property of any kind.

Building Area. The ground area in square feet under the roof of and bounded by the inside surfaces of the exterior walls of a building, and including the areas under projections from the building unless excluded by Division 45 (Projections from Buildings).

Building Line. Any private property line coterminous with a public way; or a building line established by City Ordinance.

Building Permit. Shall mean a permit required by Section 91.0201 (a) of this Code.

(c) Words beginning with "C".

City. The City of Los Angeles, California.

Combination Standpipe. A standpipe fire line having a constant water supply available in addition to the Fire Department inlet connections and installed primarily for Fire Department use.

Conforming Building. An existing building conforming to all requirements of the Code.

Construction Shed. A temporary building incidental to the construction of another building for which a permit has been issued and which is removed within 30 days after the completion of the building for which the permit was issued.

Corrosion-Resistant Metals. Any nonferrous metal, steel containing not less than 10 per cent chromium, steel containing not less than twenty-hundredths (0.20) per cent copper, or any metal having an unbroken covering of nonferrous metal.

Court. Any unoccupied space on a lot bounded on three or more sides by a building.

(d) Words beginning with "D".

Department. The Department of Building and Safety.

Dry Standpipe. A pipe with a Fire Department connection on the exterior of a building.

Dwelling. Any residential building, other than an apartment house, hotel or apartment hotel.

(e) Words beginning with "E".

Excavations. Shall mean any act by which earth, sand, gravel, rock or any other similar material is cut into, dug, quarried, uncovered, removed, displaced, relocated, or bulldozed, and shall include the conditions resulting therefrom.

Exit. A continuous and unobstructed means of egress to a public way, and shall include intervening doors, doorways, corridors, exterior exit balconies, ramps, stairways, smokeproof enclosures, horizontal exits, exit passageways, exit courts, and yards.

Exit Court. A yard, or court, providing egress to a public way for one or more required exits.

Exterior Wall. A wall located on the perimeter of the area under the roof of a building. Open spaces under the perimeter of the roof shall be presumed to be openings in the exterior wall of the building.

(f) Words beginning with "F".

Facing. A structural material applied to and bonded with a wall of different materials.

Fill. Shall mean any act by which earth, sand, gravel, rock, or any other similar material is deposited, placed, pushed, pulled or transported to a place other than the place from which it was excavated, and shall include the conditions resulting therefrom.

Fire District. Any portion of the City of Los Angeles as described in Division 16.

Fire-Retardant Treated Wood. Any lumber or plywood impregnated with chemicals which when tested in accordance with procedures set out in "Tests for Surface Burning Characteristics of Building Materials" (Designation ASTM E84) for a period of 30 minutes shall have a flamespread rating of not over 25, shall show no evidence of progressive combustion, and the smoke contribution shall not exceed 25. The fire-retardant properties shall not be considered permanent where exposed to the weather.

All treated lumber or plywood shall bear identification showing the fire performance rating thereof, issued by an approved testing agency having a re-examination service.

Floor. Any structure which divides a building horizontally and shall include the horizontal members, floor coverings, and ceiling.

Floor Area. The area in square feet within the exterior walls of a building but not including the area of inner courts, shaft enclosures, or exterior walls.

➤ **Foundation Only Permit.** A building permit issued for that portion of a building which constitutes the footings for the building and which may include those portions of the building below the grade level. <

(g) Words beginning with "G".

Gage. The term to express the thickness of metal sheets and wire. Sheet steel and iron shall be measured with the United States Standard Gage as published in the U. S. Bureau of Standards Circular No. 391, March 24, 1931. The diameter of wire shall be measured with Steel Wire Gage (Washburn & Moen) as published in the U. S. Bureau of Standards Circular No. 67, January 17, 1918.

Gas Service. A pipe conveying gas to a building from the distribution system of a public service corporation.

Grade (Adjacent Ground Elevation). The lowest point of elevation of the finished surface of the ground between the exterior wall of a building and a point five feet distant from said wall, or the lowest point of elevation of the finished surface of the ground between the exterior wall of the building and the property

line if it is less than five feet distant from said wall. In case walls are parallel to and within five feet of a public sidewalk, alley or other public way, the grade shall be the elevation of the sidewalk, alley or public way.

Grading. Shall mean excavation or fill or any combination thereof and shall include the conditions resulting from any excavation or fill.

Grading Permit. Shall mean a permit required by Section 91.0201 (b) of this Code.

Ground Water. Ground water shall mean subsurface water in a zone of saturation.

(h) Words beginning with "H".

Heliport. A heliport is an area of land or water or a structural surface which is used, or intended for use, for the landing and take off of helicopters, and any appurtenant areas which are used, or intended for use, for heliport buildings and other heliport facilities.

Helistop. A helistop is the same as a heliport, except that no refueling, maintenance, repairs or storage of helicopters is permitted.

Hillside Areas. Shall mean the land so designated in the map attached hereto and made a part of this Section as if the matters thereon set forth by map were fully described herein.*

(i) Words beginning with "I".

Incombustible Material. Any material having an ignition temperature higher than 1000 degrees Fahrenheit.

Industrial Catering Truck. An industrial catering truck is a motor vehicle used for the purpose of dispensing and selling liquids from sanitary dispensers and/or ready-to-eat food and beverages which have been prepared and sealed, or packaged on premises having a valid health permit authorizing the preparation of food, other than the vehicle from which said drink, food, or beverages are sold.

Inner Court. A court entirely within the area enclosed by the exterior walls of a building. An unroofed shaft shall be assumed to be an inner court.

(k) Words beginning with "K".

Kitchen. Any room used, intended or designed to be used for cooking and preparing food.

(l) Words beginning with "L".

Limitation. Any provision establishing limits for the purpose of this Code, and shall include both maxima and minima.

(m) Words beginning with "M".

Mall. An exit corridor over 30 feet in width which is open to the areas served and which may contain incidental uses.

Mezzanine Floor. A partial floor within a room.

Motor Vehicle. A self-propelled vehicle powered by an internal combustion motor.

(n) Words beginning with "N".

Nonconforming Building. A building, structure, or portion thereof which does not conform to the regulations of this Code and which lawfully existed at the time the regulations, with which it does not conform, became effective.

*See Map of "Hillside Areas," in Appendix.

(o) Words beginning with "O".

Occupancy. The purpose for which a room is used or intended to be used. The term "Occupancy" as used in this Code shall include the room housing such occupancy and the space immediately above a roof or structure if used or intended to be used for other than shelter.

(p) Words beginning with "P".

Panic Hardware. A horizontal bar extending across at least 50 per cent of a door and which will operate the latch and open the door if pressure is applied toward the door.

Partition. An interior wall.

Partition, Permanent. Any partition not classed as a non-rated partition.

Partition, Non-Rated. Any partition not higher than three fourths of the ceiling height of the room in which it is located or, which has one-fourth of its height in plain glass or openings, or which is constructed entirely of incombustible materials.

Penthouse. A shelter over any shaft or exit way passing through the roof and may include area for equipment necessary to the operation of the building.

Plans and Specifications. One or more drawings or documents indicating and describing the amount, arrangement, kind and quality of the materials to be used for the construction of a building or structure.

Pool. Any constructed pool used for swimming, bathing, or wading or as a fishpond or similar use.

Projection. Anything attached to and extending outside the outer face of the exterior wall of a building.

Property Line. A line separating parcels of real property having separate legal descriptions, but not including a building line.

Proscenium Wall. A wall between an assembly room and a stage.

Public Way. Any parcel of land unobstructed from the ground to the sky, more than 10 feet in width, appropriated to the free passage of the general public.

(r) Words beginning with "R".

Required. Required by the provisions of this Code.

Retaining Wall. Any wall resisting the lateral pressure of any retained liquid or solid.

Roadway. That portion of a public way appropriated to vehicular traffic.

Rock. Rock shall mean any consolidated or coherent and relatively hard natural formed mass of mineral material.

Roof. The cover of any building including the structure necessary to carry the roof load to the upright supporting members. Where the "cover" consists of any material suspended above a ground surface or slab, floor area, or roof area the areas so enclosed or covered shall be deemed to constitute a building. Exterior surfaces of roofs which slope more than two vertical to one horizontal shall be classed as exterior walls.

Roof Structures. Any structure extending from and above the roof including a shelter for the protection of equipment necessary only to the operation of the building, but excluding a penthouse,

roof sign or space for the purpose of providing additional floor area.

Room. An unsubdivided portion of the interior of a building, but not including an enclosed show window in a building.

Room, Dining. A room in which food or beverage is served for immediate consumption.

(s) Words beginning with "S".

Seepage. Seepage shall mean the flow of water through soil masses caused by gravitational forces.

Separation Wall. Any wall forming a separation between occupancies.

Sign. Any publicly displayed token or device attached to the exterior of a building or to a projection from a building.

Site. A parcel of land upon which one or more buildings are being erected or are proposed to be erected.

Skylight. A glazed structure over or within an opening through a roof.

Soil. Soil shall mean all the relatively loose incoherent earth material of whatever origin which overlies the bedrock.

Sprinklered. Provided with a fire sprinkler system which conforms to the requirements of Article 4, Chapter 9 of the Los Angeles Municipal Code.

Stage. That portion of an assembly room or area adjacent thereto which is used for any exhibition.

Stairway. A series of two or more risers with appurtenant treads.

Story. That portion of a building included between the upper surface of any floor and the upper surface of the floor next above, except that the topmost story shall be that portion of a building included between the upper surface of the topmost floor and the ceiling or roof above. If the finished floor level directly above a basement, cellar or unused underfloor space is more than six feet above grade as defined herein for more than 50% of the total perimeter, or is more than twelve feet above grade as defined herein at any point, such basement, cellar or unused under floor space shall be considered as a story.

Story, First. The lowest story in a building other than a basement.

Structural Member. Any member essential to the conveying of vertical loads or horizontal forces to the foundation.

Structure. Anything constructed or erected either upon or below the surface of the earth and which is supported directly or indirectly by the earth, but not including any vehicle which conforms to the California State Vehicle Act.

Superintendent of Building. The General Manager of the Department of Building and Safety.

(t) Words beginning with "T".

Ton. Two thousand pounds avoirdupois.

Tributary. Capable of causing an addition to the number of occupants moving along in the direction of exit along an exitway.

Type of Building. A designation of the type of construction of a building or structure.

Type of Construction. A designation indicating the classification of the construction of a building or structure as specified in Division 17, with reference to height, number of stories, materials, and fire-resistance rating.

(u) Words beginning with "U".

Underfloor Space. A space between the ground and the floor directly above.

Underpinning. Footing introduced beneath an existing footing.

Upper Story. Any story above the first story.

(v) Words beginning with "V".

Veneer. Superficial covering attached to, but not forming structural part of a wall.

Ventilation Systems. All equipment intended or installed for the purpose of supplying air to, or removing air from any room, space or equipment by gravity or mechanical means, and which is not a portion of any warm air heating system.

(w) Words beginning with "W".

Walls. The upright members forming the lateral enclosure of a building or portion thereof.

Wet Standpipe. A system of vertical pipes and interior outlets which is connected to a permanent water supply.

Window. A glazed opening through a wall.

SEC. 91.0404 — SPECIFICATIONS

(a) The dated specification in this section shall be applicable throughout this Code.

DESIGNATION

NUMBER

TITLE

(b) IRON AND STEEL

A6-69	A.S.T.M. "Specification for General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use"
➤ A615-74	A.S.T.M. "Specifications for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement" <
➤ A616-74	A.S.T.M. "Specifications for Rail-Steel Deformed and Plain Bars for Concrete Reinforcement" <
➤ A617-72	A.S.T.M. "Specifications for Axle-Steel Deformed and Plain Bars for Concrete Reinforcement" <
A27-69	A.S.T.M. "Specification for Mild-to-Medium Strength Carbon Steel Castings for General Application"
A36-69	A.S.T.M. "Specification for Structural Steel"
A53-69	A.S.T.M. "Specification for Welded and Seamless Steel Pipe"
A82-66	A.S.T.M. "Specification for Cold-Drawn Steel Wire for Concrete Reinforcement"
A148-65	A.S.T.M. "High-Strength Steel Castings for Structural Purposes"
A160-65	A.S.T.M. "Specification for Axle-Steel Bars for Concrete Reinforcement"
A184-65	A.S.T.M. "Specification for Fabricated Steel Bar or Rod Mats for Concrete Reinforcement"
A185-68	A.S.T.M. "Specification for Welded Steel Wire Fabric for Concrete Reinforcement"
A235-67	A.S.T.M. "Specification for Carbon Steel Forgings for General Industrial Use"

DESIGNATION NUMBER	TITLE
A237-67	A.S.T.M. "Specification for Alloy Steel Forgings for General Industrial Use"
A242-68	A.S.T.M. "Specification for High Strength Low Alloy Structural Steel"
A245-64	A.S.T.M. "Specification for Flat-Rolled Carbon Steel Sheets of Structural Quality"
A252-69	A.S.T.M. "Specification for Welded and Seamless Steel Pipe Piles"
A283-67	A.S.T.M. "Low and Intermediate Tensile Strength Carbon-Steel Plates of Structural Quality"
A303-64	A.S.T.M. "Specification for Hot-Rolled Carbon Steel Strip of Structural Quality"
A305-65	A.S.T.M. "Specification for Minimum Requirements for the Deformations of Deformed Steel Bars for Concrete Reinforcement"
A307-68	A.S.T.M. "Specification for Low-Carbon Steel Externally and Internally Threaded Fasteners"
A325-68	A.S.T.M. "Specifications for High-Strength Bolts for Structural Steel Joints, including Suitable Nuts and Plain Hardened Washers"
A374-68	A.S.T.M. "Specification for High Strength Low Alloy Cold-Rolled Steel Sheets and Strip"
A375-64	A.S.T.M. "Specification for High Strength Low Alloy Hot-Rolled Steel Sheets and Strip"
A377-66	A.S.T.M. "Specification for Cast Iron Pressure Pipe"
A408-65	A.S.T.M. "Specification for Special Large Size Deformed Billet Steel Bars for Concrete Reinforcement"
A416-68	A.S.T.M. "Specification for Uncoated Seven-Wire Stress-Relieved Strand for Prestressed Concrete"
A431-66	A.S.T.M. "Specification for High-Strength Billet Steel Bars for Concrete Reinforcement"
A432-66	A.S.T.M. "Specification for Deformed Billet Steel Bars for Concrete Reinforcement with 60,000 psi Minimum Yield Point"
A440-68	A.S.T.M. "Specification for High-Strength Structural Steel"
A441-68	A.S.T.M. "Specification for High-Strength Low Alloy Structural Manganese Vanadium Steel"
A446-67	A.S.T.M. Specifications for "Zinc-Coated Steel Sheets of Structural Quality, Coils and Cut Lengths"
A449-68	A.S.T.M. "Specifications for Quenched and Tempered Steel Bolts and Studs"
A490-67	A.S.T.M. "Specifications for Quenched and Tempered Alloy Bolts for Structural Steel Joints"
A500-68	A.S.T.M. "Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes"
A501-68a	A.S.T.M. "Hot Formed Welded and Seamless Carbon Steel Structural Tubing"
A502-65	A.S.T.M. "Specification for Steel Structural Rivets"
A514-69a	A.S.T.M. "Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding"
A529-64	A.S.T.M. "Specification for Structural Steel with 42 ksi Minimum Yield"
A570-66T	A.S.T.M. "Specification for Hot-Rolled Carbon Steel Sheets and Strip Grades D and E"
A572-68	A.S.T.M. "Specification for High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality"
A588-68	A.S.T.M. "Specification for High-Strength Low-Alloy Structural Steel with 50 ksi Minimum Yield"

DESIGNATION NUMBER	TITLE
A5.1-69	A.W.S. "Specifications for Mild Steel Covered Arc Welding Electrodes"
A5.5-69	A.W.S. "Specifications for Low-Alloy Steel Covered Arc Welding Electrodes"
A5.17-69	A.W.S. "Specification for Bare Mild Steel Electrodes and Fluxes for Submerged Arc Welding"
A5.18-69	A.W.S. "Specification for Mild Steel Electrodes for Gas Metal-Arc Welding"
A5.20-69	A.W.S. "Specifications for Mild Steel Electrodes for Flux Cored Arc Welding"
D1.1-72	A.W.S. "Code for Welding in Building Construction"
D2.0-69	A.W.S. "Specification for Welded Highway and Railway Bridges" (As Revised in December 1969)
A42.4-55	A.S.A. "Specification for Metal Lath and Metal Accessories and Channels"
B36.10-50	A.S.A. "Specification for Wrought Iron and Wrought Steel Pipe"
5-L-61	A.P.I. "Line Pipe"
1958	A.C.I. "Tentative Recommendations for Prestress Concrete" (reinforcement), published January, 1958, Journal of American Concrete Institute
1968	A.I.S.I. "Specification for the Design of Cold-Formed Steel Structural Members," dated 1968
391-31	U.S. Bureau of Standards "United States Standard Gauge"
AISC	AISC "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings," dated February, 1969, as revised by Supplements No. 1, 1970 and No. 2, 1971.
1966	"Specifications for Structural Joints Using ASTM A325 or A490 Bolts, issued by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation (Approved September 1, 1966)

(c) MASONRY, CONCRETE AND GYPSUM

ACI 318-71	A.C.I. Standard "Building Code Requirements for Reinforced Concrete"
C5-59	A.S.T.M. "Specification for Quicklime for Structural Purposes"
C22-50	A.S.T.M. "Specification for Gypsum"
C27-64	A.S.T.M. "Classification of Fireclay Refractories"
C28-73	A.S.T.M. "Specification for Gypsum Plasters"
C31-66	A.S.T.M. "Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Field"
C33-67	A.S.T.M. "Specifications for Concrete Aggregates"
C34-62	A.S.T.M. "Specification for Structural Clay Load-Bearing Wall Tile"
C35-70	A.S.T.M. "Specification for Inorganic Aggregates for Use in Interior Plaster"
C36-73	A.S.T.M. "Specification for Gypsum Wallboard"
C37-69	A.S.T.M. "Specification for Gypsum Lath"
C39-66	A.S.T.M. "Method of Test for Compressive Strength of Molded Concrete Cylinders"
C42-64	A.S.T.M. "Methods of Securing, Preparing, and Testing Specimens from Hardened Concrete for Compressive and Flexural Strengths"
C52-54	A.S.T.M. "Specification for Gypsum Partition Tile or Block"
C55-66T	A.S.T.M. "Specification for Concrete Building Brick"

DESIGNATION NUMBER	TITLE
C56-62	A.S.T.M. "Specification for Structural Clay Non-Load-Bearing Tile"
C57-57	A.S.T.M. "Specification for Structural Clay Floor Tile"
C61-64	A.S.T.M. "Specification for Keene's Cement"
C62-66	A.S.T.M. "Specification for Building Brick (Solid Masonry Units Made from Clay or Shale)"
C67-66	A.S.T.M. "Methods of Sampling and Testing Brick"
C73-67	A.S.T.M. "Specification for Sand-Lime Building Brick"
C79-67	A.S.T.M. "Specifications for Gypsum Sheathing Board"
C90-70	A.S.T.M. "Specification for Hollow Load-Bearing Concrete Masonry Units"
C91-67	A.S.T.M. "Specification for Masonry Cement"
C94-67	A.S.T.M. "Specification for Ready-Mixed Concrete"
C106-67	A.S.T.M. "Specification for Refractories for Incinerators"
C129-64T	A.S.T.M. "Specification for Hollow Non-Load-Bearing Concrete Masonry Units"
C138-63	A.S.T.M. "Method of Test for Weight Per Cubic Foot, Yield, and Air Content of Concrete"
C141-67	A.S.T.M. "Specification for Hydraulic Hydrated Lime for Structural Purposes"
C143-66	A.S.T.M. "Method of Test for Slump of Portland-Cement Concrete"
C144-66T	A.S.T.M. "Specification for Aggregate for Masonry Mortar"
C145-71	A.S.T.M. "Specification for Solid Load-Bearing Concrete Masonry Units"
C150-67	A.S.T.M. "Specification for Portland Cement"
C161-44T	A.S.T.M. "Specification for Hollow Load-Bearing Concrete Masonry Units"
C 175-67	A.S.T.M. "Specification for Air-Entraining Portland Cement"
C176-67	A.S.T.M. "Specification for Fireclay Plastic Refractories for Boiler and Incinerator Services"
C206-49	A.S.T.M. "Specification for Special Finishing Hydrated Lime"
C207-49	A.S.T.M. "Specification for Hydrated Lime for Masonry Purposes"
C213-66	A.S.T.M. "Specification for Fireclay-Base Castable Refractories for Boiler Furnaces and Incinerators"
C216-66	A.S.T.M. "Facing Brick"
C233-66T	A.S.T.M. "Method of Testing Air-Entraining Admixtures for Concrete"
C234-62	A.S.T.M. "Method of Test for Comparing Concrete on the Basis of the Bond Developed with Reinforcing Steel"
C260-66T	A.S.T.M. "Air-Entraining Admixtures for Concrete"
C270-59T	A.S.T.M. "Specification for Mortar for Unit Masonry"
C404-61	A.S.T.M. "Aggregates for Masonry Grout"
C494-67T	A.S.T.M. "Chemical Admixture for Concrete"
613-54	A.C.I. "Recommended Practice for Selecting Proportions for Concrete"
704-44	A.C.I. "Specifications for Cast Stone"
SS-c-181b-38	Federal Specifications for Water Retention Test for Mortar with Amendments April 20, 1939.
A59.1-72	A.S.A. "Specification for Reinforced Gypsum and Testing Methods"

**DESIGNATION
NUMBER****TITLE**

➤ D12.1-75	A.W.S. "Reinforcing Steel Welding Code" <
C442-72	A.S.T.M. "Specification for Gypsum Backing Board"
C472-73	A.S.T.M. "Methods for Physical Testing of Gypsum Plasters and Gypsum Concrete"
C475-64	A.S.T.M. "Specification for Joint Treatment Materials for Gypsum Wallboard Construction"
C514-64	A.S.T.M. "Specification for Nails for the Application of Gypsum Wallboard"
C557-73	A.S.T.M. "Specification for Adhesives for Fastening Gypsum Wallboard to wood framing"
C587-68	A.S.T.M. "Specification for Gypsum Veneer Plaster"
C588-68	A.S.T.M. "Specification for Gypsum Base for Veneer Plasters"
C630-74	A.S.T.M. "Specification for Water-Resistant Gypsum Backing Board"
C645-74	A.S.T.M. "Light-Gage Steel Studs, Runners and Rigid Furring Channels"

(d) FIRE RESISTANCE AND FLAME SPREAD

D56-64	A.S.T.M. "Method of Test for Flash Point by Tag Closed Tester"
D92-66	A.S.T.M. "Test for Flash and Fire Points by Cleveland Open Cup"
D93-66	A.S.T.M. "Method of Test for Flash Point by Means of the Pensky-Martens Closed Tester"
D374-57T	A.S.T.M. "Methods of Test for Thickness of Solid Electrical Insulation 'Method' B"
D568-61	A.S.T.M. "Test for Flammability of Plastics 0.050 in. and Under in Thickness"
D635-72	A.S.T.M. "Method of Test for Self-Supporting Plastics"
D1929-68	A.S.T.M. "Method of Test for Ignition Properties of Plastics"
D2843-70	A.S.T.M. "Method for Measuring the Density of Smoke from the Burning or Decomposition of Plastics"
E84-61	A.S.T.M. "Fire Hazard Classification of Building Materials"
E119-71	A.S.T.M. "Fire Tests of Building Construction and Materials"
E152-58	A.S.T.M. "Fire Tests of Door Assemblies"
E163-65	A.S.T.M. "Methods of Fire Test of Window Assemblies"
Latest Issue	Underwriters' Laboratories "Building Materials List"
Latest Issue	Underwriters' Laboratories "Fire Protection Equipment List"
1970	N.F.P.A. No. 80—"Standard for Fire Doors and Windows"
10 (a)	1968 Underwriters' Laboratories "Tin-Clad Fire Doors"
10 (b)	1970 Underwriters' Laboratories "Fire Tests of Door Assemblies"

(e) WOOD

C6208-72	A.S.T.M. "Specification for Structural Insulation Board Made from Vegetable Fibers"
D245-70	A.S.T.M. "Methods for Establishing Structural Grades of Lumber"
D25-70	A.S.T.M. "Specifications for Round Timber Piles"
D2277-66	A.S.T.M. "Standard Specification for Fiberboard Nail-Base Sheathing"

DESIGNATION NUMBER	TITLE
D2555-70	A.S.T.M. "Standard Methods for Establishing Clear Wood Strength Values"
ANS 05.1-72	A.N.S.I. "Specifications and Dimensions For Wood Poles"
CS31-52	U.S. Dept. Commerce "Wood Shingles" Commercial Standard
PS-1-74	U.S. Dept. Commerce "Construction and Industrial Plywood"
PS 20-70	U.S. Dept. Commerce "American Softwood Lumber Standard"
PS 56-73	U.S. Dept. Commerce "Structural Glued Laminated Timber"
AITC 117-71	A.I.T.C. "Standard Specifications For Structural Glued Laminated Timber of Douglas Fir, Western Larch, Southern Pine and California Redwood"
AITC 120-71	A.I.T.C. "Standard Specifications For Structural Glued Laminated Timber Using 'E' Rated and Visually Graded Lumber of Douglas Fir, Southern Pine, Hem-Fir, and Lodgepole Pine"
C1-73	AWPA Standard — All Timber Products — Preservative Treatment by Pressure Processes
C2-73	AWPA Standard — Lumber, Timbers, Bridge Ties and Mine Ties — Preservative Treatment by Pressure Processes
C3-73	AWPA Standard — Piles — Preservative Treatment by Pressure Processes
C4-73	AWPA Standard — Poles — Preservative Treatment by Pressure Processes
C9-72	AWPA Standard — Plywood — Preservative Treatment by Pressure Processes
C23-72	AWPA Standard — Round Poles and Posts Used in Building Construction — Preservative Treatment by Pressure Processes
C28-73	AWPA Standard — Preservative Treatment of Structural Glued Laminated Members and Laminations before Gluing of Southern Pine, Pacific Coast Douglas Fir and Western Hemlock by Pressure Processes
1970	R.I.S. "Standard Specifications for Grades of California Redwood Lumber" including ALSC approved Supplements
1970	W.C.L.I.B. "Standard Grading Rules No. 16" including ALSC approved Supplements
1970	W.W.P.A. "Standard Grading Rules For Western Lumber" including ALSC approved Supplements
1955	U.S. Dept. Agriculture "Wood Handbook" No. 72
1973	N.F.P.A. "National Design Specification for Stress Grade Lumber and its Fastenings"
V815 472	A.P.A. "Design Specifications for Plywood-Lumber Components"
V820 772	A.P.A. "Fabrication Specifications Plywood-Lumber Components"

(f) MISCELLANEOUS

Z97.1-1972	A.N.S.I. American National Standard Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings"
E413-70T	A.S.T.M. "Determination of Sound Transmission Class"

DESIGNATION NUMBER	TITLE
E90-70	A.S.T.M. "Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions" (Tests conducted under E90-66T and E90-61T when the specification was in effect at the time of testing will be considered acceptable.)
E492-73T	A.S.T.M. "Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine"
E336-71	A.S.T.M. "Measurement of Airborne Sound Insulation in Buildings"
D1557-58T	A.S.T.M. "Test for Moisture-Density Relations of Soils Using 10-lb. Rammer and 18-in. Drop"
HHF-191	Federal Specifications "Felt"
SS-R-521	Federal Specifications "Mineral Surfaced Cap Sheets and Asphalt Shingles"
UU-P-147	Federal Specification "Paper, Building Waterproofed"—Type II, Class D
SS-A-666	Federal Specifications "Roofing Asphalt"
E-SS-R-501	Federal Specification "Smooth Surfaced Cap Sheets"
CS 251-63	U.S. Dept. Commerce "Hardboard"
CS 236-66	U.S. Dept. Commerce "Mat-Formed Wood Particle-Board"
A131.1-1971	A.N.S.I. "Standard for Chimneys, Factory-Built, Residential Type and Building Heating Appliance"

DIVISION 5 — OCCUPANCY

General

SEC. 91.0501 — GENERAL

(a) **Scope.** In addition to the requirements of the special Occupancy Divisions of this Article, every Occupancy Group and Subgroup shall conform to the general requirements of this Division.

(b) **Classification.** Every Occupancy shall be classified in the appropriate Subgroup by the Superintendent of Building.

(c) **Multiple Occupancy.** For the purpose of determining allowable building area and type of construction, a building housing more than one occupancy shall be classified in the occupancy subgroup for which the area and fire-resistive requirements are the most restrictive.

EXCEPTIONS: 1. This shall not apply to the area limit on J-1 Occupancies.

2. Group E Occupancy accessory areas are exempt as provided in Division 10 of this Code.

SEC. 91.0502 — DEFINITIONS OF OCCUPANCIES

For the purpose of this Code, certain occupancies are defined as follows:

(a) Group A Occupancies:

Subgroup A-1: Every assembly room having a stage which has a ceiling more than five feet above the highest point of the proscenium opening and which room has an occupant load of 1000 or more.

(b) Group B Occupancies:

Every assembly room or stadium, grandstand or reviewing stand having a capacity of more than 50 occupants and not classified as a Group A or Group S Occupancy.

Subgroup B-1: Every Group B Occupancy appropriated to the showing of motion pictures, using ribbon type film over seven-eighths inch wide.

Subgroup B-2: Every Group B Occupancy not classified in Subgroup B-1 or B-3.

Subgroup B-3: A Group B Occupancy without enclosing walls, stadiums, reviewing stands and grandstands.

(c) Group S Occupancies:

Subgroup S-1: Every building or portion thereof used for school, educational, or child care purposes for more than eight hours per week, for more than six persons, 16 years of age or under, involving assemblage for instruction, education, care or recreation, including assembly rooms accessory thereto. Services provided to each individual shall be for less than 18 hours a day.

(d) Group D Occupancies:

Group D occupancies shall be classified as provided in this Subsection. Such occupancies shall be limited to the uses listed herein and, with the exception of jails and as otherwise expressly provided herein, shall be limited to facilities for which a license, permit or other written approval is required to be issued by the State of California or the County of Los Angeles as a condition of the operation of such uses.

TABLE NO. 5-A — REQUIRED SEPARATIONS IN BUILDINGS OF MULTIPLE OCCUPANCY

Legend: 4—"Four-hour Separation" 3—"Three-hour Separation"						1—"One-hour Separation" N—No separation required				
Group	A	B	S	D	E	F	G	H	R	J
A	N	N	N	3	*	3	3	1	1	1
B		N	N	3	*	3	1	1	1	1
S			N	1	*	3	1	1	N	1
D				N	*	4***	4***	N	N	3
E					*	*	*	*	*	*
F						N	1	3	1	N
G							N	N	N	1
H								N	N	1
R									N	1**
J										N

* See Table No. 10-B.

** See Section 91.1402.

*** Two-Hour when G Occupancy is accessory to D Occupancy.

**** Three-Hour when F Occupancy is for passenger vehicles parking only.

Subgroup D-1: Mental hospitals, mental sanitariums, jails, and buildings where the persons accommodated or maintained therein are restrained in individual rooms, wards, cells or cell blocks by locking devices.

Subgroup D-2: Homes or institutions for the full-time care of more than six children under kindergarten age; hospitals, sanitariums or nursing homes with more than six non-ambulatory patients; mental hospitals and mental sanitariums accommodating or maintaining persons who are restrained by means of locked exterior doors only, and similar use buildings accommodating more than six persons.

Subgroup D-3: Nursing homes accommodating more than six ambulatory patients; homes or institutions accommodating more than six aged persons; and homes or institutions accommodating more than six children of kindergarten age or over.

This Subgroup shall also include buildings and facilities not classified in any other D occupancy Subgroup which provide out-of-home care to more than six clients of the Bureau of Social Work, Division of Protective Social Services, Department of Social Welfare of the State of California, or which house more than six persons who are patients of state hospitals for the mentally deficient and for the mentally ill who have been granted leave of absence therefrom by the Superintendents thereof pursuant to the California Welfare and Institutions Code. The Subgroup classification established in this paragraph shall apply regardless of whether the facilities named herein are or are not required to have issued a license, permit, or other written approval by the State of California or the County of Los Angeles as a condition of the operation thereof.

(e) **Group E Occupancies.** Every room or structure housing hazardous materials unless exempted under Section 91.1001.

(f) **Group F Occupancies:**

Subgroup F-1: Every heliport and every room in which flammable liquids in lots of more than one gallon are dispensed for use in motor vehicles or in which motor vehicles are repaired or stored unless classified as a Subgroup F-1P, Group S or Group J Occupancy.

Subgroup F-1P: An open parking garage structure of Type I, II, or IV construction which is at least 50 percent open on two or more sides and is used for the parking or storage of passen-

ger motor vehicles having a capacity of not more than nine persons per vehicle.

(g) Group G Occupancies

Subgroup G-1: Every room appropriated to the sale, exhibition, storage or processing of goods, and if not classified in Groups E or F or Subgroup G-2 Occupancies and every helistop, but not including waiting rooms with a capacity of more than 50 persons.

Every room housing business or professional offices or appropriated to personal services.

Subgroup G-2: Every building or portion thereof appropriated to the processing, storage, or sale of food or drink for human consumption, but not including any private dwelling or public dining room having room for more than 50 occupants.

(h) Group H Occupancies: **Subgroup H-1:** (Repealed) **Subgroup H-2:** Every apartment house. **Subgroup H-3:** Every hotel. **Subgroup H-4:** Every apartment hotel.

EXCEPTION: A subgroup H-2 Occupancy may be classified as a series of R-1 Occupancies, provided:

1. That except for the roof sheathing, exterior walls and footings, each dwelling unit is structurally separated from the adjoining dwelling unit.

2. That the two walls of the adjacent dwelling units which comprise the common wall assembly shall be constructed to conform to one of the following:

A. Each of the two walls shall be of one-hour fire resistive construction; or

B. The two walls shall be constructed to provide a combined two-hour fire resistive rating.

3. The common wall assembly shall be composed of building materials installed in accordance with a construction system which has been tested and achieved a Sound Transmission Class (STC) rating of not less than 55 (50 if field tested) determined in accordance with ASTM Standards E90 or E336, the testing having been conducted by a testing agency approved by the Department. Should it appear during construction that the common wall assembly will not achieve the required Sound Transmission Class (STC) rating, a field test may be required by the Department.

4. Openings in the common wall assembly or penetration of the wall surface shall be individually provided with acoustic insulation sufficient to maintain the required sound transmission rating of the wall.

5. Each dwelling unit shall comply with the applicable dwelling requirements of Division 49.

(i) Group R Occupancies:

Subgroup R-1: Every dwelling and every accessory building thereto.

(j) Group J Occupancies:

Subgroup J-1: Every room appropriated to the parking of motor vehicles having a capacity of not more than nine persons per vehicle, not accessory to a dwelling, not used for fueling or repair work, and not having an area exceeding 3,000 square feet.

RULE OF GENERAL APPLICATION #21-68 APPLIES. SEE APPENDIX LISTING.

SEC. 91.0503 — SEPARATION OF OCCUPANCIES

(a) General. When a building is used for more than one occupancy each part of the building comprising a distinct "Occu-

pancy", shall be separated from any other occupancy as specified in (d) of this Section. The area of the entire building shall be limited as specified in Section 91.0506 for the most restricted occupancy.

(b) **Forms of Occupancy Separation.** Occupancy separations shall be of such form as may be required to afford a complete separation between the various occupancy groups or subgroups housed within a building.

Structural members furnishing the vertical support for occupancy separations shall be protected by fire-resistive construction equivalent to that required for the occupancy separation.

(c) **Types of Occupancy Separation.** Occupancy separations shall be classed as "four-hour", "three-hour", "two-hour", and "one-hour".

1. A "Four-hour Occupancy Separation" shall have no openings therein and shall be of not less than four-hour fire-resistive construction.

2. A "Three-hour Occupancy Separation" shall be of not less than three-hour fire-resistive construction.

Openings in walls shall be permitted if not greater in aggregate width in any one story than 25 per cent of the length of any wall in that story. Every opening shall be protected by a fire protection assembly having a three-hour fire-resistive rating.

Openings in floors shall be enclosed by two-hour fire-resistive shafts. Openings into the shafts shall be protected by a fire assembly having a one and one-half hour fire-resistive rating.

3. A "Two-hour Occupancy Separation" shall be of not less than two-hour fire-resistive construction, except for shaft enclosures.

Opening in walls shall be protected by a fire assembly having a one and one-half hour fire-resistive rating.

Openings in floors shall be enclosed by one-hour fire-resistive shafts. Openings in shafts shall be protected by a fire assembly having a one-hour fire-resistive rating.

4. A "One-hour Occupancy Separation" shall be of not less than one-hour fire-resistive construction. All openings in such separations shall be protected by a fire assembly having a one-hour fire-resistive rating.

(d) **Fire Ratings for Occupancy Separations.** Occupancy separations shall be provided between the various groups and divisions of occupancies as set forth in Table No. 5-A.

EXCEPTIONS: 1. Unless specifically required, assembly rooms having a floor area of not more than 600 square feet, administrative and clerical offices, and accessory room, need not be separated by an occupancy separation from the occupancy to which they are related, if the aggregate area of such rooms does not exceed 25 per cent of the area of the occupancy. This exception does not apply to Group E Occupancies.

2. Public dining rooms having a capacity not to exceed 300 occupants and accessory to a retail sales area need not be separated from a Group G Occupancy provided the kitchen area, including food preparation and food storage rooms, is separated from the rest of the building by one-hour fire-resistive construction. Fire protection of openings will not be required.

3. Rooms used for religious education and other church activities which are accessory to a church auditorium and which are not used for daily school purposes need not be separated from the church auditorium.

4. Separation of a roof occupancy and the occupancy below need not exceed two-hour fire-resistive construction.

SEC. 91.0504 — EXTERIOR WALL PROTECTION & SETBACKS

(a) **General.** Every building except Group R Occupancies shall have exterior wall protection as required by this Section.

The term "Protected Opening" shall mean an opening protected by a fire assembly having a three-fourths hour fire-resistive rating.

(b) Subsection repealed.

(c) **Exterior Wall Protection.** Unless otherwise specified in the special occupancy divisions of this Article, every building except Group R Occupancies shall have no openings within three feet of and facing a property line, and shall have at least one-hour fire-resistive construction for exterior walls within three feet of and facing a property line. Exterior walls located directly above and parallel to division walls shall have protected openings and shall be of not less than one-hour fire-resistive construction.

(d) **Buildings on the Same Property.** Separate buildings on the same property shall be assumed to have a property line between them unless the separate buildings are designed and constructed as portions of a single building with the intervening space considered as an inner court. Where separate buildings are considered as portions of a single building but house different occupancies or are of different types of construction, the combined area shall not exceed that allowed for the most restrictive occupancy and lowest type of construction.

(e) **Fire Districts.** Buildings located in a Fire District shall have exterior wall protection as specified in Division 16 in addition to the general requirements of this Section.

(f) Subsection repealed.

(g) **Separation from Oil Wells.** No building more than 400 square feet in area and less than 36 feet in height shall be erected within 50 feet from the center of an oil well casing and no building 36 feet or more in height shall be erected closer to the center of an oil well casing than a horizontal distance equal to one and one-half times the height of the building, provided, however, that such distance need not exceed 200 feet. Said building shall be measured vertically from the adjacent ground elevation adjoining such building to the ceiling of the top story.

EXCEPTION: The distance separation between a building and an oil well may be reduced to:

1. 35 feet if a solid masonry wall not less than 6 foot high and 6 inches thick is constructed between the oil well and all portions of said buildings which are less than 50 feet from the wall;

2. 25 feet if all walls of the building which are located less than 50 feet from the oil well are of one-hour fire-resistive construction, have no openings, and are surmounted by a 3 foot high parapet;

3. 15 feet if all walls of the building which are located less than 50 feet from the oil well are of two-hour fire-resistive construction, have no openings, and are surrounded by a 3 foot high parapet.

No building used for the housing of human beings located on any premises where there is a school, hospital, sanitarium, theater or motion picture theater shall be within 200 feet from

**TABLE NO. 5-B — BASIC ALLOWABLE FLOOR AREA
FOR BUILDINGS ONE STORY IN HEIGHT (In Sq. Ft.)**

TYPES OF CONSTRUCTION	GROUPS OF OCCUPANCY ⁽¹⁾								
	A	B	S	D-1	D-2 D-3	F-1	G	H	R
I	Unlimited								
II	25000	25000	33000	10000	10000	20000	45000	25000	Unlimtd.
III	*	15000	21250	*	6800	12500	30000	15000	Unlimtd.
IV, III-A	*	9000	12750	*	6800	7500	18000	9000	Unlimtd.
III-B	*	7200	10200	*	5200	5000 ⁽²⁾	14400	7200	Unlimtd.
V	*	6000	8500	*	5200	3800 ⁽³⁾	12000	6000 ⁽³⁾	Unlimtd.

* Prohibited.

NOTES:⁽¹⁾ For Group E Occupancy, see Division 10, Table No. 10-D.⁽²⁾ F-1 Occupancies used only for parking of passenger motor vehicles may have a basic allowable floor area of 6,000 square feet.⁽³⁾ Areas on the second floor shall not exceed 4000 square feet unless the building is of one-hour fire-resistive construction.

the center of an oil well casing, nor shall any public utility fuel manufacturing plant, or public utility electrical generating, receiving or distribution plant be located closer than 200 feet from the center of the oil well casing.

SEC. 91.0505 — Section repealed.**SEC. 91.0506 — AREA LIMITATIONS**

(a) General. Every building shall be limited in area as required by this Section. Area increases described in this Section are not applicable to Group J-1 Occupancies.

For the purpose of determining building area, any portion of a building separated from all other portions of the building by a division wall shall be considered a separate building.

The increases of floor areas permitted in this Section may be additive when applicable, except that such increases for one-hour fire-resistive construction shall not apply when other provisions of this Code require such construction.

EXCEPTION: The floor area increase for one-hour, fire-resistive construction will be allowed for three-story, Group H Occupancies, provided all interior public corridors serving occupant loads of 30 or more have each opening protected by a tight fitting, smoke or draft stop fire assembly having a time period rating of 20 minutes by ASTM E158 without the hose stream test. Transom or ventilating openings to interior public corridors are prohibited.

For the purpose of this Division, a yard is an open, unoccupied space on the lot on which a building is located, permanently maintained as an integral part thereof, and free of all obstruction from the ground up.

(b) Basic Areas. Except as permitted elsewhere in this Section, the building area of every one-story building shall not exceed the amounts exhibited in Table No. 5-B based upon the area allowed for the most restrictive occupancy housed in the building.

EXCEPTION: Where accessory areas are used by the occupants of the major occupancies of the building, the allowable building area shall not be limited by the occupancy classification of such accessory occupancies provided that the area of such accessory occupancies does not exceed one-tenth of the floor area of the story in which such areas occur.

For buildings over one story in height, the total area of all floors shall not exceed 200 per cent of the area allowed for one-story buildings, provided, however, that no single floor area

shall exceed that permitted for one-story buildings. Sprinklered basement areas and roof occupancies, except F-1P, need not be included in the total area of floors.

(c) **One-Hour Fire Resistance.** For buildings having at least one-hour fire-resistive construction, the areas specified in Subsection (b) of this Section for Types III-B, IV, and V may be increased one-third.

(d) **Separation on Two Sides.** Where public space, streets, or yards, more than 20 feet in width, extend along two sides of a building, the areas specified in Subsection (b) of this Section or modified in this Section may be increased at the rate of one and one-fourth per cent for each foot by which the minimum width exceeds 20 feet, but the increase shall not exceed 50%.

(e) **Separation on Three Sides.** Where public space, streets, or yards, more than 20 feet in width, extend along three sides of a building, the areas specified in Subsection (b) of this Section or modified in this Section may be increased at a rate of two and one-half per cent for each foot by which the minimum width exceeds 20 feet, but the increase shall not exceed 100 per cent.

(f) **Separation on All Sides.** Where public space, streets, or yards, more than 20 feet in width, extend on all sides of one and two-story buildings and adjoin the entire perimeter, the areas specified in Subsection (b) of this Section or modified in this Section may be increased at a rate of five per cent for each foot by which the minimum width exceeds 20 feet, but the increase shall not exceed 100 per cent.

EXCEPTION: Such increase shall not be limited to 100 per cent for Group G Occupancies.

(g) **Unlimited Area.** The area of any one or two-story building of Group F and G Occupancy shall not be limited, if the building is sprinklered throughout and entirely surrounded by public space, streets, or yards not less than 60 feet in width.

(h) **Sprinklers.** The areas specified in Subsection (b) of this Section may be tripled if the building is sprinklered throughout.

(i) **Three-Hour Exterior Walls.** In Types III-B, IV, or V Buildings, any exterior wall constructed as required for a "three-hour separation" and extending two feet above the adjacent roof within 10 feet of said wall, but not less than three feet above the wall-roof intersection, shall be considered the equivalent of a 20-foot yard and may be used in lieu thereof.

(j) **Division Walls.** Portions of a building completely separated by a division wall shall be considered as separate buildings, provided the division wall extends from the foundation to an elevation at least two feet above the lower roof elevation. The aggregate width of openings in any one story shall not exceed 25 percent of the length of the wall in that story.

Every opening in a division wall required to be of four-hour fire resistance shall be protected by a fire assembly having a three-hour fire-resistive rating. Every opening in a division wall required to be of two-hour fire resistance shall be protected by a fire assembly having a one and one-half hour fire-resistive rating.

The type of construction and the time period of fire resistance of every division wall shall conform to the exterior wall requirements for that portion of the building having more fire-resistive type of construction. In no case shall the time period of fire resistance be less than two hours.

(k) **Yard Restriction.** The increase in area permitted by Subsections (d), (e), (f) and (g) of this Section, shall not be allowed unless or until the owner of the required yard shall file with the Department an agreement binding such owner, his heirs and assignees, to set aside the required yard as an un-

obstructed space having no improvements. Such agreement shall be recorded in the Los Angeles County Recorder's Office.

(1) **Special Area Increases for Group G.** For Group G Occupancies, where both the building and contents are incombustible, areas in excess of those provided elsewhere in this Section may be approved by the Department, if the Department finds the fire hazard to be no greater than that resulting from allowable areas and occupancies. All such approvals in excess of a ten per cent increase over areas permitted elsewhere in this Section shall have the concurrence of the Fire Department. To obtain increased area pursuant to this Subsection, the owner shall file with the Department a recorded agreement to make the building conform to Code in the event that the use of the building is changed.

➤ SEC. 91.0507 — FIRE SAFETY STANDARDS FOR EXISTING BUILDINGS

(a) **Purpose.** The purpose of this Section is to provide a reasonable degree of fire safety for persons occupying existing buildings.

(b) **Scope.** The provisions of this Section shall apply to all existing buildings more than two stories in height which do not conform to the minimum shaft enclosure and exit requirements of this code and which are not required to comply with Section 17.33 of the State Fire Marshal's Title 19 Fire Safety Regulations for existing buildings over 75 feet in height. The provisions of this Section shall not authorize the modification of existing buildings or portions thereof which provide a greater degree of protection against fire than the minimum requirements established by this Section.

EXCEPTION: The requirements of this Section shall not apply to:

1. *Group D-3, H and R Occupancies. Existing Group D-3 and H Occupancies shall have fire safety standards as required by Section 91.1302 of this Code.*

2. *Buildings erected after January 1, 1943.*

(c) **Shaft Enclosures.** Every opening in a floor shall be enclosed as required by Section 91.1705 (b) for shaft enclosures provided, however, that existing enclosure walls constructed of wood lath and plaster or equivalent fire-resistive materials and which are in good condition may be accepted in lieu of enclosure wall construction.

Corridor exits which are interrupted by stairwell enclosures required by this Subsection shall be provided with exit door fire assemblies which will close automatically when activated by an approved smoke detector.

EXCEPTIONS: 1. The shaft protection required by this Section may be omitted if the building is sprinklered throughout.

2. *Existing metal elevator doors need not be replaced if they are in good condition. Such doors may have openings protected with wire glass.*

3. *Conveyor and equipment systems openings may be protected as specified in Section 91.1061(d).*

(d) **Exits.** Two reasonable separated and accessible exits shall be provided from each floor.

EXCEPTION: Existing fire escapes which are in structurally sound operational condition may be used as one means of egress.

Exit signs with letters at least six inches high shall be installed in conspicuous locations at each exit from the floor and whenever otherwise required to clearly indicate the direction of egress from area served.◀

SEC. 91.0508 — FOOD ESTABLISHMENTS

(a) **General.** This Section shall apply to every building or portion thereof appropriated to the processing, storage or sale of

food or drink for human consumption, but not including any private dwelling. Every food establishment shall conform to the requirements of this Code.

EXCEPTIONS: 1. Food establishments that are used exclusively for the sale of farm produce sold at or on the premises where produced.

2. Food preparation units installed in school buildings with the following provisions:

(i) A sign must be posted requiring all mouthed utensils to be of single use, disposable type.

(ii) The floor surface of the area must be of linoleum, asphalt tile, or equivalently non-absorbent material.

(iii) A residential-type vent must be installed when a kitchen range is provided.

3. Employee lunch rooms if no food other than beverages is prepared on the premises, and provided all mouthed utensils are of the disposable type. Heating devices limited to this use need not be vented.

4. Food establishments in which all food is to be sold in sealed packages, and in which there is to be no preparing or packaging of food, shall comply with all applicable food establishment regulations. The Certificate of Occupancy shall state "Packaged Food Only".

(b) **Walls and Ceilings.** The walls and ceilings in rooms or portions thereof, where food or drink is prepared, packaged, handled or stored, and in areas where dishes and utensils are washed, and of toilet rooms, and dressing rooms shall be of smooth fire clay tile, ceramic tile, portland cement plaster, hard wall gypsum plaster, terrazzo or similar durable, washable material. Stainless steel, aluminum, galvanized iron, tempered masonite, exterior grade plywood or other approved material may be used for walls or ceilings provided the first five and one-half inches above the juncture of the wall and floor are of approved floor surfacing material and the juncture between wall and floor materials is smooth, and the finish of the surfaces complies with the other requirements of this Subsection. Walls in milk processing and dairy products manufacturing rooms, poultry or rabbit slaughtering or eviscerating rooms and in rooms for storing or holding live poultry or rabbits or any similar uses shall be of portland cement plaster, tile, terrazzo, or similar durable waterproof material to a height of at least six feet above the floors. All walls and ceilings regulated by this Subsection shall have a finished surface which is light colored, smooth, durable and washable. No overhead trusses, beams, struts or braces which may accumulate dust and dirt, other than metallic rods or readily cleanable beams and structural members shall be exposed in food preparation rooms.

EXCEPTIONS: 1. The provisions of this Subsection shall not apply to any place where only unopened cans, cartons, sacks, or other food containers are stored, sold or kept, or to fruit and vegetable packing or storage sheds, rooms or warehouses.

2. Acoustical surfaces, the holes of which do not penetrate all the way through the material, which are sufficiently smooth so they can be kept in a clean and sanitary condition; which are applied so they will withstand heat, moisture or other conditions in the environment where installed without loosening or buckling; and which are finished in a light color with a durable hard washable finish, shall be allowed at a height above six feet except in slaughtering rooms or food processing rooms where more than normal splashing, food dust or other operations would cause unsanitary conditions.

(c) **Floor Surface.** Every first story floor or basement floor shall be concrete or masonry built directly upon the ground and all floor surfaces shall be smooth concrete, fire clay tile, ceramic tile, terrazzo or similar impervious, durable material without

any additional floor covering. The floor material of all floors subject to frequent wetting or floors which require flushing in accordance with Subsection (d) hereof shall extend upward onto the walls at least five and one-half inches with a cove having a radius of at least three-eighths inch. The juncture between the floor and the vertical surface of all masonry islands shall be provided with a cove having a radius of at least three-eighths inch.

EXCEPTIONS: 1. If above a first story floor which meets the requirements of this Subsection or if directly above a basement with a concrete or masonry floor and concrete or masonry walls, floors of food establishments may be built of lumber or other approved structural materials, provided the surface is finished as required in this Subsection. Such floors as are not required to slope to drains may be surfaced with smooth tongue and groove hardwood.

2. The floors of those areas of restaurants restricted to dining only, or retail sales areas with no food preparation, may have surfaces of materials other than those stipulated in this Subsection provided they can be maintained in a clean and sanitary condition.

3. In portions of bakeries and similar food establishments where the floors are not subject to frequent wetting, smooth tight hardwood floors may be applied over and sealed to concrete floors.

(d) **Floor Drains and Gutters.** The floors of all rooms or portions of rooms which are subject to frequent wetting or which require flushing with water shall be of concrete, fire clay tile, ceramic tile or masonry, and shall slope to a suitable floor drain or covered gutter constructed as follows:

1. The gutters shall be smooth finished and have rounded bottoms, be at least eight inches wide, and sloped to a suitable drain with covers set flush with the floor and easily removable. No gutter shall be placed under any fixed equipment unless the bottom of such equipment is at least 12 inches above the floor surface.

2. The juncture between floor and walls or raised masonry islands and corners in gutters shall be rounded with a cove of at least three-eighths inch radius.

(e) **Ceiling Heights.** Every room shall have a ceiling height of not less than eight feet between the finished floor and the finished ceiling.

EXCEPTIONS: 1. Toilet rooms may have a ceiling height of not less than seven feet, six inches.

2. Refrigerated cold storage rooms are exempted from this ceiling height requirement.

(f) **Doors and Windows.** All exterior doorways or doorways to other buildings or uses which normally remain open shall be provided with well-fitting doors and screens except that a space not wider than one-fourth inch may be permitted at the bottom of doors. Screen doors, when provided, shall be self-closing and open outward if on a required legal exit. All openable windows shall be equipped with screens in removable sash.

EXCEPTIONS: 1. Fans may be used in lieu of screens for the exclusion of flies when approved as to size and location by the Health Department.

2. Sandwich stands may be designed to serve customers on the outside provided the open spaces are equipped with windows or other devices fastened to the building and arranged so they can be easily closed when the business is not being operated and provided pastries and similar items are kept in sanitary fly-protected cases.

3. Kitchen or processing room doors may be provided with a screened opening for at least one-third of their area in lieu of a screen door. The door shall be self-closing and open outward.

4. Fly screens need not be provided on rooms used only for storing, handling, or selling packaged, canned or bottled goods in the original unopened containers.

(g) **Ventilation.** Kitchen and food preparation rooms including garbage rooms shall be ventilated by either of the following:

1. With windows or vents of which total openable area is not less than 12 square feet or one-tenth of the floor area of the room, whichever is greater.

2. By a mechanical system of ventilation capable of changing the air in the room or space it serves every fifteen minutes.

(h) **Special Ventilation.** A mechanical exhaust ventilation system capable of effectively removing cooking odors, smoke, steam, grease, and vapors shall be provided at or above cooking equipment such as ranges, griddles, ovens, deep fat fryers, barbecues and rotisseries.

All hoods, ducts, fans and other devices provided to ventilate the cooking areas of commercial food preparation equipment in commercial food establishments shall be installed as required by and in compliance with, the provisions of Division V, Article 5, Chapter 9 of the Los Angeles Municipal Code (Heating, Ventilating and Air Conditioning Code). Rooms in which such exhaust systems are installed shall be provided with acceptable air inlets to admit at least as much air as is exhausted by such systems.

Ducts penetrating a ceiling or floor shall be enclosed in a shaft enclosure conforming to the requirements of Division 17 of this Article. Where a shaft enclosure is not required by Division 17 of this Article such ducts shall be enclosed in a fire-resistive shaft covered on one side as required for one hour fire-resistive construction with no combustible materials used inside the fire-proofing and the shaft shall be separated from the duct by a minimum three-inch air space vented to the outside air.

(i) **Toilet Rooms and Vestibules.** Toilet rooms and vestibules for public or employees shall conform to the following standards:

1. **Toilet Rooms Required.** At least one toilet room shall be provided for every food establishment. Adequate separate toilet facilities for each sex shall be provided where the number of employees is five or more. In or immediately adjacent to every toilet room required hereunder there shall be installed one-half as many lavatories as there are water closets and urinals. Each lavatory shall be equipped with running hot and cold water.

Each place of business selling beer, wine, or liquor to be consumed on the premises shall be provided with separate toilet rooms for each sex, which also are readily available to the customers and patrons. These toilet rooms shall contain at least one water closet and lavatory, and at least one urinal for men.

2. **Location.** Toilet rooms shall be located on the premises of the food establishment. Toilet rooms for public use shall be readily accessible to customers. Toilet rooms shall be separated from other portions of the establishment by a tight-fitting, self-closing door.

Additional lavatories or equivalent hand washing facilities shall be provided in all food preparation areas where the lavatories required in Subdivision 1 are not convenient on the same floor and in or adjacent to the food preparation areas.

3. **Privacy.** Toilet rooms shall be so arranged or equipped with view screens as to protect users of toilets and urinals from view from outside the room when the door to the toilet room is open. Entrances to the toilet rooms for different sexes shall be properly separated by a space of at least 10 feet or by view screens.

4. **Dimensions.** Toilet rooms shall have dimensions and area as required by Section 91.0512(d).

EXCEPTION: In retail stores used exclusively for the sale

of packaged food, the area requirements of Section 91.0512(d) shall not apply, provided a minimum width of three feet is maintained.

5. Construction. Partitions between toilet rooms intended for use by opposite sexes shall be double-walled, plastered, or of equivalent, durable, reasonably soundproofed, tight construction.

Toilet room floors shall be of concrete, fire clay, tile, ceramic tile, masonry or similar durable material which extends upward onto the walls at least five and one-half inches and with a cove having a radius of at least three-eighths of an inch. No linoleum, asphalt tile, or similar composition floor covering shall be installed in any toilet room.

6. Urinals. The walls and floor space adjacent to any urinal shall comply with Section 91.0512 (c) of this Code. The floor of a toilet room containing a urinal shall slope to a floor drain or to a floor-type urinal installed so as to properly drain the floor.

(j) Dressing Rooms. Dressing rooms or enclosures with facilities for employees to store their clothes shall be provided for all restaurants and for all food establishments where five or more employees are on duty at any time. Where separate toilets are required for employees of each sex, dressing facilities shall be provided for each sex.

Dressing rooms shall be separated from food storage rooms, and food preparation areas and shall be provided with self-closing doors.

(k) Sinks and Drain Boards. Food preparation establishments shall be provided with the following:

1. Not less than a two-compartment sink equipped with hot and cold running water, with a minimum capacity of five gallons in each compartment, a minimum depth of nine inches, together with a suitable waste and overflow drain.

Not less than a three-compartment sink with metal drainboards where multi-use eating and drinking utensils are washed by hand and where chemicals are used for sanitization. The capacities and depths of each compartment shall be as specified above.

2. Two separate drainboard spaces with a slope of at least one-eighth inch per foot toward the sink shall be provided immediately adjacent to sinks used for washing multi-use utensils.

3. Drainboards shall be of No. 16 gauge (minimum) galvanized or corrosion-resistant metal. Sink shall be of metal and of thickness as set forth in the Plumbing Code.

4. Suitable flushing facilities shall be installed for removing gross soil from utensils and for disposal of food residue.

5. Sinks for the washing of vegetables shall be provided in the salad department of restaurants, vegetable preparation rooms, and at fruit and vegetable stores.

EXCEPTION: *Where only glasses, cups, saucers and silverware are washed at soda fountains or bars, each sink basin shall have minimum dimensions and capacity as follows: six and one-half-inch water depth; eight-inch width; three and one-half gallon liquid capacity.*

(l) Garbage Rooms. Restaurants with a seating capacity of fifty or more patrons shall be provided with a room or enclosed space for the keeping of garbage containers. The room shall have portland cement plaster, fire clay tile, ceramic tile or equally durable waterproof walls to a height of at least six feet above the floor. Doors and windows of such rooms shall be tight-fitting and self-closing and all exterior openings shall be screened. Each such room shall be equipped with a hose or other suitable garbage can washing device connected to hot and cold

running water and the floor shall slope to a drain and comply with Subsection (d) hereof.

EXCEPTION: *Such garbage rooms need not be provided at places maintaining an approved device for discharging garbage to the sewer system.*

(m) **Loading Platforms.** Every food manufacturing or processing plant shall be so designed that platforms used for loading or unloading trucks or vehicles shall be entirely separated from any processing room by means of tight-fitting doors which shall be screened.

(n) **Rat-Protection.** Every food establishment shall be completely surrounded by a continuous exterior foundation wall not less than 12 inches below grade.

(o) **Living and Sleeping Quarters.** Living and sleeping quarters shall be separated from food establishments by full partitions and solid, tight-fitting doors.

SEC. 91.0509 — SPECIAL HAZARD ROOMS

(a) **General.** ➤ Rooms appropriated for use as film vaults, explosive vaults, spray rooms, cellulose nitrate film processing rooms, transformer vaults, boiler rooms, drying rooms, furnace rooms, motor generator rooms, refrigeration machinery rooms, rubbish rooms, or rooms used for the storage or dispensing of hazardous materials shall conform to the applicable requirements set forth in Division 41 of this Article. <

(b) **Storage Rooms.** Every room exceeding 500 square feet in the area appropriated for the storage of combustible materials, other than those enumerated in Subsection (a) of this Section, accessory to retail stores shall be separated from the retail sales area by a one-hour fire-resistive partition and ceilings with openings protected by a fire assembly having a one-hour fire-resistive rating.

EXCEPTIONS: 1. *For rooms not exceeding 1,500 square feet a solid one and three-eighths inch self-closing wood slab door may be used in lieu of the required fire assembly.*

2. *The separation may be omitted in buildings in which all areas are equipped with a sprinkler system complying with Article 4 of Chapter IX of the Municipal Code.*

(c) **Kitchens.** All areas housing cooking equipment such as ranges, griddles, ovens, deep fat fryers, barbecues and rotisseries shall be separated from any mall by a one-hour occupancy separation conforming to Section 91.0503. All grease hoods shall be equipped with a fire extinguishing system approved by the Los Angeles Fire Department.

EXCEPTION: *The occupancy separation will not be required, subject to Department approval, where the only food preparation equipment is small warming or heating appliances which do not produce appreciable amounts of steam, grease or smoke.*

SEC. 91.0510 — FIRE PUMPS

➤ Every fire pump and accessory equipment other than water tanks installed in buildings to serve standpipe or hydrant systems shall be exclusively housed in a room of two-hour fire-resistive construction. Every opening, except vents, shall be equipped with a self-closing fire assembly having a one and one-half-hour fire-resistive rating. The exhaust from internal combustion engine, if used as a motivating power, shall be connected to a vent complying with Section 91.4112 of this Code. The floor area shall be sufficient to provide at least a three-foot working space around the fire pump, motor and accessory equipment. <

SEC. 91.0511 — STANDPIPES

(a) **Interior Wet Standpipes.** Every building three or more stories in height shall be provided with interior wet standpipes.

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See excerpts from L. A. MECHANICAL CODE (Sections 95.12300—12420 inclusive) concerning construction requirements for refrigerating equipment installations in APPENDIX section at end of this code.

See excerpts from L. A. ELECTRICAL CODE (Sections 93.4523—4548 concerning construction requirements for transformer installations in APPENDIX section at end of this code.
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Separate wet standpipe risers are not required for buildings having combination standpipes which also serve the required 1½" wet standpipe outlets.

EXCEPTIONS: *The requirements of this Subsection shall not apply to:*

1. *Group R Occupancies.*
2. *Completely sprinklered basements or stories. (This exception shall not apply to requirements for stages having a proscenium).*
3. *Buildings three stories in height where the first story is unused under-floor space or a J-1 Occupancy.*

(b) **Combination and Dry Standpipes.** Every building four or more stories in height shall have combination standpipes.

EXCEPTION: *Buildings not exceeding 150 feet in height may have dry standpipes in lieu of combination standpipes.*

Standpipes may be placed on either the exterior or the interior of a building. If placed on the interior, dry standpipe piping shall be protected by not less than two-hour fire-resistive construction or may be located within a two-hour fire-resistive shaft.

(c) **Repealed**

(d) **Standpipes During Building Construction.** Every building six stories or more in height shall be provided with one standpipe for temporary Fire Department use during construction, when topmost construction reaches six stories in height. Such a standpipe shall be provided with Fire Department inlet connections at an accessible location, and located adjacent to usable stairs and shall be extended to within two floors of topmost construction at all times.

Where building height will require installation of a combination standpipe, the fire pump and water main connections shall be provided for Fire Department use when construction height reaches 150'. 2½" outlets shall be provided on every floor above the first floor or landing if standpipe is permanent and on every floor or landing above the third floor, if temporary.

(e) **Installation.** All standpipes shall be installed in accordance with the requirements of the Los Angeles Plumbing Code.

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See excerpts from L. A. PLUMBING CODE concerning construction requirements for standpipe installations in APPENDIX section at end of this code.
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SEC. 91.0512 — GENERAL SANITATION

(a) **Toilet Room Separation.** Where two sexes are accommodated and separate toilet rooms are maintained, such toilet

rooms shall be completely enclosed and the water closets and urinals shall be located or screened so as to protect the users from view from without the toilet rooms.

(b) **Ventilation of Toilet Rooms.** Unless otherwise specified in this Chapter, each toilet room shall have one of the following systems of ventilation:

1. **Forced draft system of ventilation** providing an air change in such room each five minutes.

2. At least 140 square-inch duct in horizontal direction or a 50 square-inch duct in vertical direction for every five toilet or urinal fixtures, or fraction thereof, in such toilet room or rooms. Where more than one toilet room is connected to a common duct, the cross-sectional area of such duct shall be based upon the total number of toilets and urinal fixtures served by such common duct. No duct shall be decreased in size due to change of direction.

3. At least two square feet of window area, openable in half its area, opening onto a yard, court or public way for each five toilet or urinal fixtures, or fraction thereof, in such toilet room.

(c) **Urinals. 1. Protection of Walls and Floors.** The walls and floor space, including back and side walls, of any urinal stall to a point one foot in front of the urinal lip and four feet above the floor shall be of hard, burned glazed tile, marble, slate or of some equally nonabsorbent material. If there is no urinal stall, the wall or walls back of or at the side of the urinal to a point four feet above the floor and one foot on either side of the urinal shall be protected in the manner hereinbefore described. The floor shall be protected in a like manner to a point one foot in front of the urinal lip.

2. **Stall Urinals.** Where stall urinals are used, all intervening wall and floor space between urinals and the wall or walls and floor to a point one foot on either side of the urinal or battery of urinals, shall be protected as hereinabove described.

(d) **Employee Toilet Facilities.** In every building toilet facilities shall be provided, or be available on the premises, for the use of the people employed in the building. Separate toilet facilities for each sex shall be provided where the number of employees exceeds five.

Toilet rooms shall be not less than three feet wide nor contain less than 18 square feet of floor area.

SEC. 91.0513 — COVERED WALKWAYS (ARCADES)

Covered walkways connecting separate buildings and used exclusively as passageways need not be considered as adjacent buildings for the provisions of this Division, provided that the walls of the building adjoining the walkway structures are finished with the same construction as required for the exterior walls of the building, and there are no communicating openings between the walkway structures and the building, except doors; and provided that the walkway structures are of not less than one-hour fire-resistive construction or entirely of incombustible materials, or of heavy timber construction with two-inch nominal sheathing.

DIVISION 6 — REQUIREMENTS FOR GROUP A OCCUPANCIES

SEC. 91.0601 — GROUP A OCCUPANCIES DEFINED

A Group A Occupancy shall be every assembly room having a stage which has a ceiling more than five feet above the highest point of the proscenium opening and which room has an occupant load of 1000 or more.

SEC. 91.0602 — CONSTRUCTION, HEIGHT AND AREA ALLOWABLE

(a) General. Buildings or portions thereof used for Group A Occupancies shall conform to the general requirements of Division 5 and to the requirements of this Division.

(b) Special Provisions. A Group A Occupancy shall be permitted only in a Type I or Type II building and shall be at least one-hour fire-resistive construction throughout.

Stages shall conform to the requirements of Division 39.

Isolated ticket booths may be of all incombustible construction without a fire-resistive time period rating.

All Group A Occupancies shall be accessible to, and usable by, the physically handicapped in accordance with the requirements set forth in Part 5.5, Division 13 of the Health and Safety Code of the State of California.

SEC. 91.0603 — LOCATION ON PROPERTY

(a) Street Frontage. Every building housing a Group A Occupancy shall front directly upon or have access to a public way not less than 20 feet in width. The access to the public way shall be a minimum 20-foot wide unobstructed exit court. The main entrance to the building shall be located on the public way or on the exit court. The main assembly floor shall be located at or near the adjacent ground level.

(b) Exterior Wall Protection. Exterior walls within five feet of and facing a property line shall be of not less than four-hour, fire-resistive construction without openings.

Exterior wall openings within 20 feet of and facing a property line shall be protected by a fire assembly having a three-fourths hour fire-resistive rating.

Nonbearing exterior walls may have a fire-resistive time period rating of two-hours where protected openings are required and one-hour where unprotected openings are permitted.

SEC. 91.0604 — EXIT FACILITIES

Stairs and exits shall be provided as set forth in Division 33. The specific requirements for Group A Occupancies in Section 91.3315 shall prevail over the general provisions of Division 33.

SEC. 91.0605 — LIGHT, VENTILATION AND SANITATION

(a) Light and Ventilation. All portions of Group A Occupancies and all dressing rooms shall be provided with light and ventilation by means of windows or skylights with an area of not less than one-eighth of the total floor area, one-half of which shall be openable, or shall be provided with artificial light and a mechanically operated ventilation system. The mechanical system shall supply a minimum of five cubic feet per minute per occu-

pant of outside air with a total circulation of not less than 15 cubic feet per minute per occupant in all portions of the building and such system shall be kept continuously in operation during such time as the building is occupied.

Lights in all parts of the building customarily used by human beings shall be installed and controlled as required by Article 3 of Chapter IX of the Los Angeles Municipal Code (Electrical Code).

(b) **Sanitary Facilities.** Every Group A Occupancy shall be provided with at least one water closet and one urinal for every 200 males and one water closet for every 100 females or major fraction thereof. One lavatory shall be provided for each two water closets or urinals required. Where both sexes are admitted, the sexes shall be assumed to be equally divided.

At least one drinking fountain shall be provided at each floor level.

SEC. 91.0606 — ENCLOSURE OF VERTICAL OPENINGS

Every opening in a floor shall be enclosed as required by Division 17 for shaft enclosures. Enclosures for exits shall also comply with the requirements of Division 33.

SEC. 91.0607 — FIRE-EXTINGUISHING SYSTEMS

Outside of Fire Districts Nos. 1 and 2, every basement with a required exit termination more than four feet above the basement floor elevation and having an area exceeding 1500 square feet shall be sprinklered.

SEC. 91.0608 — SPECIAL HAZARDS

(a) **Gas Shutoff.** Every gas service to the stage portion of the building shall be separated from any other service to the building and each gas service shall be equipped with a shutoff device conspicuously marked and which is located in an accessible place outside the building.

(b) **Hazardous Materials.** Hazardous materials as defined in Division 10 shall not be placed or stored within any building housing a Group A Occupancy.

(c) **Rooms.** ➤ Boiler rooms and other hazardous-use rooms shall conform to the requirements of Division 41. Motion picture projection rooms shall conform to the requirements of Division 40. ⚡

DIVISION 7 — GROUP B OCCUPANCIES

SEC. 91.0701 — GENERAL

(a) **Scope.** In addition to the general requirements of Division 5 of this Article, every building or structure housing a Group B Occupancy shall conform to the requirements of this Division.

SEC. 91.0702 — CONSTRUCTION

(a) **Area Limitation.** Every building housing a Group B Occupancy shall be limited in area as set forth in Section 91.0506 of this Article.

(b) **Occupancy Separations.** Every Group B Occupancy shall be separated from any other occupancy as set forth in Section 91.0503 of this Article.

The exceptions of Section 91.0503 (d) shall not apply to a kitchen located in a building housing a Group B Occupancy where the Group B Occupancy has an occupant load in excess of 300 occupants.

(c) **Type of Construction.** Every Subgroup B-1 Occupancy located above the first floor shall be housed in a Type I or Type II building.

Every Subgroup B-2 Occupancy located above the first floor shall be housed in a Type I or Type II building when the capacity of any one room above the first floor exceeds 300 occupants.

Every Subgroup B-2 Occupancy located above the second floor shall be housed in a Type I or Type II building when the capacity of any one room above the second floor exceeds 100 occupants.

Every Subgroup B-3 Occupancy shall be of all incombustible construction when the capacity of a single roofed structure exceeds 1,200 occupants.

EXCEPTION: Seats and foot boards may be of wood not less than one and one-half inches in thickness.

(d) **One-Hour Construction.** Every Subgroup B-1 or Subgroup B-2 Occupancy having an occupant load of more than 300 occupants in the total assembly areas of the building shall be of of not less than one-hour fire-resistive construction throughout.

EXCEPTIONS: 1. Assembly areas having an occupant load of less than 300 occupants which exit independently of all other assembly areas need not be included in determining the total number of occupants for purposes of this section.

2. Any construction conforming to the provisions of Section 91.1706 of this Article need not be protected.

3. One-story Subgroup B-3 Occupancies of Type III-A, III-B, IV or V construction may have open roof construction of unprotected materials without a ceiling.

4. Isolated ticket booths may be unprotected if constructed of all incombustible materials.

(e) **Stage Construction.** Stages shall conform to the requirements of Division 39 of this Article.

(f) Repealed.

SEC. 91.0703 — LOCATION ON PROPERTY

(a) **Exterior Wall Protection.** Every Subgroup B-2 Occupancy having a capacity of more than 300 occupants in any one room

and every Subgroup B-1 Occupancy shall have exterior walls of at least two-hour fire-resistive construction without openings when located within five feet of and facing a property line. Exterior walls for such occupancies shall be of at least one-hour fire-resistive construction and shall have all openings protected by a fire assembly having a three-fourths hour fire-resistive rating when located within 10 feet of and facing a property line.

SEC. 91.0704 — EXITS

Stairs and exits shall be provided as set forth in Division 33 of this Article.

(a) **Exit Doors.** 1. **Location.** Every exit door serving a Subgroup B-2 Occupancy having a capacity of more than 300 occupants in any one room or for a Subgroup B-1 Occupancy shall be located within 100 feet of an exit stairway or an exterior doorway.

2. **Locks.** Every exit door serving an occupant load in excess of 100 occupants shall be provided with panic hardware or shall omit any lock or latch.

EXCEPTION: On the doorway which is the main and obvious means of egress, panic hardware may be omitted and a key locking device used provided there is a readily visible metallic sign adjacent to the doorway stating "This door must remain unlocked during business hours — Los Angeles Municipal Code." The first sentence shall be in letters at least one inch in height. When unlocked, a single door and each leaf of a pair of doors must be free to swing without operation of any latching device. The locking device on a pair of doors must be arranged so that when one leaf is unlocked, the other is free to swing. Flush edge or surface bolts or any other type of device that may be used to close or restrain the doors other than by operation of the locking device are prohibited.

(b) **Corridors.** Every corridor shall have walls and ceilings of at least one-hour fire-resistive construction.

EXCEPTION: In Type I buildings which are sprinklered throughout, incombustible walls, partitions and ceilings of corridors need not meet the fire-resistive requirements of this Subsection, provided the interior finish materials comply with Division 42.

(c) **Balconies.** Balcony exits shall be provided as set forth in Division 6 of this Article for Group A Occupancies.

(d) **Stairs.** Exterior stairs and ramps shall be constructed of incombustible materials.

(e) **Prohibited Means of Egress.** Stages, kitchens, and other accessory areas shall not be used as a means of egress for any assembly area having a capacity of more than 300 occupants.

SEC. 91.0705 — LIGHT AND VENTILATION

Light and ventilation shall be provided as set forth in Division 6 of this Article for Group A Occupancies.

SEC. 91.0706 — SANITARY FACILITIES

(a) **General.** Sanitary facilities shall be provided as set forth in Division 6 of this Article for Group A Occupancies.

Every Group B Occupancy shall be provided with not less than one water closet, one urinal, and one lavatory for men, and not less than one water closet and one lavatory for women.

(b) **Temporary Tents.** Chemical toilet facilities conforming to

Ordinance No. 127,507 may be used as accessory to temporary tent occupancies when constructed as required by this article.

SEC. 91.0707 — SPECIAL HAZARDS

(a) **Hazardous Materials.** Hazardous materials shall not be placed or stored within any Group B Occupancy.

(b) **Labeled Gas Shutoff.** Every gas service to a building housing a Group B Occupancy having an occupant load in excess of 300 persons shall be provided with a labeled gas shutoff device. The label shall be of corrosion resistant metal at least three inches high.

DIVISION 8 — GROUP S OCCUPANCIES

SEC. 91.0801* — GENERAL

(a) **Scope.** In addition to the general requirements of Division 5 of this Article, every building housing a Group S Occupancy shall conform to the requirements of this Division.

(b) **Kindergarten and Pre-kindergarten Rooms.** Every kindergarten room and every pre-kindergarten room shall be located in the first story.

EXCEPTION: Isolation and toilet rooms may be located on the second floor, provided two means of egress are available when the occupant load of the rooms served exceeds 20.

SEC. 91.0802 — CONSTRUCTION

(a) **Area Limitations.** Every building housing a Group S Occupancy shall be limited in area as set forth in Section 91.0506 of this Article.

The allowable area increase permitted by Section 91.0506(c) for one-hour fire-resistive construction throughout shall not be applicable to one-story buildings required to be of one-hour, fire-resistive construction by this Section.

(b) **Occupancy Separations.** Every Group S Occupancy shall be separated from any other occupancy as set forth in Section 91.0503 of this Article.

EXCEPTION: Group S Occupancies shall not require an occupancy separation from adjoining accessory Group G Occupancies.

(c) **One-Story Buildings.** One-story buildings shall conform to the requirements of this Subsection.

1. **Fire-resistive construction.** Every building exceeding 4,500 square feet in area shall be of at least one-hour fire-resistive construction throughout.

EXCEPTIONS: A. (Repealed).

B. Buildings need not be of fire-resistive construction, provided every classroom has at least one exit directly to a public way or adequate dispersal area.

C. Buildings used only for instruction in the use of machine or hand tools and not exceeding 10,000 square feet in area need not be of fire-resistive construction.

D. Any construction conforming to the provisions of Section 91.1706 of this Article need not be protected.

2. (Repealed)

3. **Mudsill footings.** Isolated wood frame buildings used for instructional purposes only, and not exceeding 35 feet in width, 75 feet in length, or one story in height may be constructed on wood mudsills placed on the ground surface.

(d) **Buildings Over One Story.** Every Group S Occupancy located within an upper story shall be housed in a Type I or Type II building.

EXCEPTIONS: 1. Buildings of other than Type I, Type II or Type V construction and not exceeding two stories in height may be used to house Group S Occupancies in the upper

*California Educational Code Section 12002 requires a fire alarm system for schools having an occupant capacity of 50 or more students or more than one classroom.

story, provided that the building is of one-hour fire-resistive construction throughout except as provided in Section 91.0804(b)2 and there are no openings, protected or otherwise, in the floor and ceiling separating the first and second stories, and every room has exterior exit to at least two exterior incombustible stairs.

8. *Buildings of other than Type I or Type II construction and not exceeding two stories in height may be used to house Group S Occupancies in the first story, provided that the Group S Occupancy conforms to the requirements of a one-story building as set forth in subsection (c) above.*

(e) **Basements.** Every basement shall be of Type I or Type II Construction with no openings into any portion of a building not of Type I or Type II Construction, or shall be completely sprinklered.

Basement rooms used for purposes other than class rooms, toilet rooms, boiler rooms, or rooms housing electrical equipment shall be sprinklered.

Every room housing a Group S Occupancy and located in a basement shall have at least one exit directly to the exterior of the building.

(f) **Stages.** Stages shall conform to the requirements of Division 39 of this Article.

(g) Repealed.

(h) **Assembly Rooms.** In addition to the requirements of this Division, Assembly Rooms shall comply with the provisions of Subsection (c), (d) and (e) of Section 91.0702 of this Article.

(i) **Sprinklers.** All hallways, stair shafts, stairways, basements, laboratory and vocational rooms, and other usable areas not customarily used for class, toilet or assembly rooms shall be sprinklered. A sprinkler system required under the provisions of this part shall be electrically interconnected to the building fire alarm system.

EXCEPTIONS: 1. *The Superintendent of Building may, after referral to and report from the Fire Department, approve alternate methods of obtaining the equivalent fire protection and safety.*

2. *Sprinklers may be omitted provided every room used for instruction purposes or assembly is provided with exits giving direct egress to the exterior of the building.*

3. *Covered walkways complying with the requirements of Section 91.0513 and balconies need not be sprinklered.*

4. *Sprinklers may be omitted from one-story buildings with windows having sills not more than three feet above the floor and not more than six feet above the adjoining exterior grade. Each classroom shall have at least one window which provides a minimum clear opening of 24 inches by 36 inches and is easily openable without a key or other special knowledge.*

(j) **Roof Covering.** The roof covering of every building used by over 20 children shall be a fire retardant roof covering to conform to Division 32 of this Article.

SEC. 91.0803 — LOCATION ON PROPERTY

(a) **Exterior Wall Protection.** On buildings used by over 20 children, exterior walls within five feet of and facing a property line shall be of at least two-hour, fire-resistive construction without openings.

On buildings used by over 20 children, exterior walls within ten feet of and facing a property line shall be of at least one-hour, fire-resistive construction.

(b) **Street Frontage.** Every building housing a Group S Occupancy used by over 20 children shall front directly upon a public way or exit court at least 20 feet in width.

SEC. 91.0804 — EXITS

Stairs and exits shall be provided as set forth in Division 33 of this Article.

(a) Exit Doors.

1. **General.** Every exit door shall open in the direction of egress and into a corridor, covered porch or to the exterior of the building.

Every room housing a Group S Occupancy shall have at least one exit in accordance with Division 33 of this Code. Every room housing a Group S Occupancy and having an occupant load of at least 20, but not more than 50, shall be provided with an emergency means of egress through a door of not less than 24 inches in width and six feet eight inches in height opening to an adjoining room or balcony which provides emergency egress to the exterior ground surface. Every kindergarten room and every pre-kindergarten room shall have at least one exit directly to the exterior of the building. Every room used by non-ambulatory children shall have at least one exit directly to the exterior of the building with such exit being located not more than three feet above grade and transition being provided by means of a conforming ramp.

2. **Location.** Every exit door shall be located within 100 feet of a stairway or an exterior doorway in a Type I or Type II building and shall be not more than 75 feet from a stairway or exterior doorway in any other type of building.

3. **Locks.** Every exit from a corridor and every exit from a room having a capacity of more than 100 occupants shall be provided with panic hardware or shall omit any lock or latch. All other exit doors shall have a type of lock that cannot be locked against egress and all latches or locks on any door or leaf of a pair of doors shall be operated by one control device.

4. **Fences and Gates.** School grounds may be fenced and gates equipped with locks, provided adequate safe student dispersal areas are provided between the buildings and the fence. Gates shall not be permitted across corridors or passageways leading to such dispersal areas, unless they comply completely with legal exit requirements.

(b) **Corridors.** 1. **Width.** Except where every classroom has at least one exit directly to the exterior of the building, every corridor shall be at least two feet wider than the minimum width established by Division 33 of this Article but shall be not less than six feet in width.

2. **Construction.** The walls, ceilings, and floors of every hallway, corridor, or stairway, shall be of at least one-hour fire-resistive construction.

EXCEPTION: Covered walkways complying with Section 91.0513 need not be of one-hour fire-resistive construction.

(c) **Stairs.** Every upper story housing a Group S Occupancy shall have at least two means of egress, one of which shall be an exterior stairway of incombustible construction.

Stairs serving every upper story having an occupant load of more than 100 shall be not less than five feet in width except for projections permitted by Division 33 of this Article.

CITY OF LOS ANGELES

ORDINANCE NO. 145,461, EFF. 2/18/74

Subsection (d) of Section 93.740-6 of the Los Angeles Municipal Code (Electrical Code).

(d) In schools, the automatic sprinkler system valve alarm shall be electrically connected to the fire warning system so as to operate the general alarm system in event of water flow in the fire sprinkler system.

CITY OF LOS ANGELES

ORDINANCE NO. 118,202, EFF. 3/24/64

Section 94.30321 of the Los Angeles Municipal Code (Plumbing Code).

(1) Schools. In schools the automatic alarm device shall be electrically connected to the fire warning system so as to operate the general alarm system in the event of water flow in the sprinkler system. The electrical wiring shall conform to Article Three, Chapter Nine of the Municipal Code.

SEC. 91.0805 — LIGHT AND VENTILATION

(a) Windows. Every room housing a Group S Occupancy shall be provided with windows having a total aggregate area equal to not less than one-eighth of the floor area of the room except where artificial lighting and mechanical ventilation are provided. One-half of the required window area may be in skylights or clerestory windows. At least one-third of the required window area shall be openable.

Windows may open under a covered porch or walkway, provided the covered porch or walkway conforms to the following:

1. The outside wall faces a public way, court or yard of at least 10 feet in width;

2. The porch or walkway has a ceiling height of not less than eight feet;

3. The porch or walkway is not more than eight feet in width;

4. The outside wall is entirely open except for structural features.

(b) Mechanical Ventilation and Artificial Lighting. Mechanical ventilation of sufficient capacity to completely change the air within the room every 15 minutes may be used in lieu of required windows if sufficient artificial lighting is provided.

A combination of mechanical ventilation and openable window area shall be permitted provided the sum of the percentages of the required amount of each method of ventilation is at least 100 %.

(c) Toilet Rooms. Every toilet room shall be provided with windows having a total aggregate area equal to not less than one-tenth of the floor area of the room except where artificial lighting and mechanical ventilation are provided. At least one-half of the required window area shall be openable.

Mechanical ventilation conforming to the requirements of Subsection (b) above may be used in lieu of required windows.

SEC. 91.0806 — SANITARY FACILITIES

(a) Buildings Over One Story. Every building over one story in height shall be provided with toilet facilities as set forth in Table No. 8-A.

Every floor having a capacity of more than 100 occupants shall be provided with toilet facilities for each sex.

(b) One-Story Buildings. Toilet facilities as set forth in Table No. 8-A shall be provided within 200 feet of every one-story classroom building.

TABLE NO. 8-A — SANITARY FACILITIES

	ELEMENTARY		HIGH OR JR. HIGH	
	First 120 Students of each sex	Additional Students of each sex	First 120 Students of each sex	Additional Students of each sex
Water Closet				
Male	1 for 40	1 for 100	1 for 40	1 for 100
Female	1 for 20	1 for 30	1 for 30	1 for 50
Urinals				
Male	1 for 30	1 for 50	1 for 40	1 for 50

Lavatories: One for each two toilets or urinals for each sex.

(c) **Number of Facilities Required.** For the purpose of determining the number of toilet facilities required, the number of students shall be based on the maximum expected occupant load per classroom, but shall be not less than one student for each 30 square feet of classroom area, and one student for each 50 square feet of shop instruction area.

Where each sex will constitute approximately one-half the total number of students, the sexes shall be assumed to be equally divided. In other cases, the number of toilet facilities for each sex shall be based upon the maximum number of students of each sex who will occupy the building at any one time.

The maximum number of students per fixture shall not be greater than as set forth in Table No. 8-A.

(d) **Toilet Room Separation.** Except for kindergarten and pre-kindergarten rooms, toilet facilities serving over 20 children shall be placed in separate rooms for each sex. Each toilet room shall clearly indicate the sex accommodated therein.

(e) **Kindergartens.** Every building housing a kindergarten shall have sanitary facilities provided within the building on the same floor level with the kindergarten. There shall be not less than one water closet for every 25 children accommodated within the kindergarten with a minimum of two water closets provided for every kindergarten building. One lavatory shall be provided for every toilet or urinal. The number of children shall be the maximum number expected at any one time, but shall be not less than one child for each 35 square feet of kindergarten area.

(f) **Pre-kindergarten Room.** Every building housing a pre-kindergarten room shall have one water closet and one lavatory for the first 14 children or less. In addition, one water closet and one lavatory shall be provided in a separate location for isolation purposes.

For buildings housing over 14 children, additional water closets and lavatories shall be provided at the rate of one each for each additional ten children. The number of children shall be the maximum number expected at any one time but shall not be less than one child for each 35 square feet of pre-kindergarten room area.

SEC. 91.0807 — SPECIAL HAZARDS

(a) **Motor Vehicle Repair Rooms.** Every motor vehicle repair room shall be located in the first story and shall be separated from any adjoining Group S Occupancy by at least a one-hour fire-resistive occupancy separation.

Two exits shall be provided from every motor vehicle repair room exceeding 1,000 square feet in area.

Floors shall be constructed of incombustible materials.

(b) Repealed.

(c) Labeled Gas Shutoff. Every gas service to a building housing a Group S Occupancy shall be provided with a labeled gas shutoff device. The label shall be of corrosion resistant metal with letters at least three inches high.

SEC. 91.0808 — EXCEPTIONS AND DEVIATIONS

Gymnasiums may have running tracks or resilient floors of unprotected wood or metal where the required floor system is separately provided.

SEC. 91.0809 — EXISTING GROUP S OCCUPANCIES

(a) Scope.

1. This section shall apply to every lawfully existing Group S Occupancy housed in a building constructed prior to July 1, 1961.

(b) Certificate of Occupancy.

1. Revocation. The Certificate of Occupancy for any lawfully existing Group S Occupancy housed in a building constructed prior to July 1, 1961, may be revoked by the Superintendent of Building as follows, if upon inspection the building is found in violation of requirements of this section:

i. If the violations, defects or hazards found to be existing therein are immediately dangerous to the public health, safety or general welfare, and if effective repair is not commenced within 180 days after the issuance of an order to do so by the Department; or

ii. If the violations, defects or hazards found to be existing therein are not of such a nature as described hereinabove, and effective repair is not commenced within five years after the issuance of an order so to do by the Department.

2. Issuance. A new Certificate of Occupancy shall be issued for any lawfully existing Group S Occupancy housed in a building constructed prior to July 1, 1961, if such building is either made to comply with all of the requirements of this Division, or is made to comply with the requirements of Subsections (f), (g) and (h) of this section.

(c) Other Laws. Except as otherwise specifically provided for herein, this section does not repeal, alter or modify any other provisions of this Code.

(d) Violation. It shall be unlawful for any person to use or permit the use of any building for a Group S Occupancy:

1. After a Certificate of Occupancy has been revoked in accordance with the provisions of Subsection (b) of this Section after July 1, 1961;

2. In any case where a Certificate of Occupancy has not been issued, unless the building is constructed in full conformity with all other applicable provisions of this Code; or

3. Unless such building is constructed, operated, used, and maintained as required by this Section.

(e) Alternate Methods.

1. The Superintendent of Building may, after referral to and report from the Fire Department, approve alternate methods of obtaining the equivalent fire protection and safety required by this Section, provided the Superintendent finds that the existing condition of the building under consideration makes strict conformity impracticable and that such alternate methods are within the purpose and intent of this Section.

(f) One-Story Buildings. One-story buildings shall conform to

the requirements of this Section and Section 91.0802(c) and (l) of this Code.

(g) Buildings Over One Story.

1. Type V buildings two stories or more in height shall not be used to house Group S Occupancies unless such buildings are completely sprinklered.

EXCEPTION: Complete sprinklers are not required where the Group S Occupancy is only in the first story of a two-story building and the Group S Occupancy conforms to the requirements of a one-story building as set forth in this Section.

2. Every building over one story in height shall have sprinklers installed in all hallways, stair shafts, stairways, basements, laboratory and vocational rooms, and other useable areas not customarily used for class, toilet or assembly purposes.

EXCEPTIONS: 1. The Superintendent of Building may, after referral to and report from the Fire Department, modify the above requirement, provided it is first found that equivalent alternate safety measures are provided.

2. Sprinklers may be omitted, provided every room used for instruction purposes or assembly is provided with exits giving direct egress to the exterior of the building.

3. Covered walkways complying with the requirements of Section 91.0513 and balconies need not be sprinklered.

3. A sprinkler system required under the provisions of this part shall be electrically interconnected to the building fire alarm system.

(h) General.

1. All requirements of this Code with respect to exits shall be complied with.

EXCEPTIONS: 1. The provisions of Section 91.1703(b) which require shaft enclosures need not be complied with, provided the provisions of this part are met.

2. The provisions of Section 91.0804(a) requiring two means of egress when the occupant load is equal to or greater than 20 need not be complied with.

2. Every boiler using liquid or solid fuel shall be housed in a boiler room separated from the rest of the building by two-hour fire-resistive construction with openings protected by a fire assembly having a one and one-half hour fire-resistive rating.

3. Every boiler using fuel gas shall be housed in a boiler room separated from the rest of the building by one-hour fire-resistive construction with openings protected by a fire assembly having a one-hour fire-resistive rating.

4. Each gas piping system serving a Group S Occupancy shall be provided with a gas shutoff valve designed to close the flow of gas to the piping system and a label designating such valve. The label shall be of corrosion-resistant metal with letters at least three inches high, stating: "GAS SHUTOFF VALVE".

5. Any fire warning system required to be installed by the Los Angeles Fire Department pursuant to the provisions of Article Seven, Chapter Five of the Municipal Code shall meet the requirements of Division 707 of Article Three, Chapter Nine of said Code.

DIVISION 9 — GROUP D OCCUPANCIES

SEC. 91.0901 — GROUP D OCCUPANCIES DEFINED

Group D occupancies shall be classified as provided in this Subsection. Such occupancies shall be limited to the uses listed herein and, with the exception of jails and as otherwise expressly provided herein, shall be limited to facilities for which a license, permit or other written approval is required to be issued by the State of California or the County of Los Angeles as a condition of the operation of such uses.

Subgroup D-1: Mental hospitals, mental sanitariums, jails, and buildings where the persons accommodated or maintained therein are restrained in individual rooms, wards, cells or cell blocks by locking devices.

Subgroup D-2: Homes or institutions for the full-time care of more than six children under kindergarten age; hospitals, sanitariums or nursing homes with more than six non-ambulatory patients; mental hospitals and mental sanitariums accommodating or maintaining persons who are restrained by means of locked exterior doors only, and similar use buildings accommodating more than six persons.

Subgroup D-3: Nursing homes accommodating more than six ambulatory patients; homes or institutions accommodating more than six aged persons; and homes or institutions accommodating more than six children of kindergarten age or over.

This Subgroup shall also include buildings and facilities not classified in any other D Occupancy Subgroup which provide out-of-home care to more than six clients of the Bureau of Social Work, Division of Protective Social Services, Department of Social Welfare of the State of California, or which house more than six persons who are patients of state hospitals for the mentally deficient and for the mentally ill who have been granted leaves of absence therefrom by the Superintendents thereof pursuant to the California Welfare and Institutions Code. The Subgroup classification established in this paragraph shall apply regardless of whether the facilities named herein are or are not required to have issued a license, permit, or other written approval by the State of California or the County of Los Angeles as a condition of the operation thereof.

SEC. 91.0902 — CONSTRUCTION, HEIGHT AND AREA ALLOWABLE

(a) General. Buildings or portions thereof used for purposes of Group D Occupancies shall comply to the general requirements of Division 5 and to the requirements of this Division.

(b) Special Provisions. 1. Type of Construction. Every Subgroup D-1 and D-2 Occupancy more than one story in height and every Subgroup D-3 Occupancy more than two stories in height shall be housed in a building of Type I or Type II construction. Type II buildings shall not exceed three stories in height and shall not exceed two stories for D-1 Occupancies.

2. One-Hour Construction. Every Group D Occupancy shall be of at least one-hour fire-resistive construction throughout.

3. Restraint. Every Group D Occupancy where restraint is practiced shall be housed in a building of Type I or Type II construction.

EXCEPTION: One-story buildings of Type III, IV or V construction and of one-hour fire-resistive construction through-

out may be permitted for D Occupancies where restraint is practiced, provided the floor area does not exceed 3,900 square feet between separation walls of two-hour fire-resistive construction with openings protected by fire assemblies having 1½-hour fire-resistive ratings.

Exterior doors may be fastened with locks provided that the room doors shall not be fastened by other means than doorknobs or similar devices which may be opened readily from the corridor side without the use of keys. Subgroup D-1 Occupancies in which the personal liberties of the inmates are restricted within the building shall have floors of incombustible construction.

SEC. 91.0903 — LOCATION ON PROPERTY

Exterior wall construction shall comply with the regulations of Divisions 16 and 17.

Exterior walls within five feet of and facing a property line shall be of not less than two-hour fire-resistive construction. All other exterior walls shall be of not less than one-hour fire-resistive construction.

No exterior wall opening shall be permitted within five feet of and also facing a property line. Exterior wall openings shall comply with the regulations of Division 16; however, any opening within 10 feet of and facing a property line shall be protected by a fire assembly having a three-fourths hour fire-resistive rating.

SEC. 91.0904 — EXIT FACILITIES

Stairs and exits shall be provided as set forth in Division 33. The specific requirements for D Occupancies in Section 91.3318 shall prevail over the general provisions of Division 33.

SEC. 91.0905 — LIGHT, VENTILATION, SANITATION AND ROOM SPACES

Every Subgroup D-2 and D-3 Occupancy shall be provided with light, ventilation, sanitation and room spaces which are not less than required in Division 49 for residential uses.

SEC. 91.0906 — ENCLOSURE OF VERTICAL OPENINGS

Every opening in a floor shall be enclosed as required by Division 17 for shaft enclosures.

SEC. 91.0907 — FIRE EXTINGUISHING SYSTEMS

An automatic sprinkler system shall be installed and maintained in an operable condition in every building or portion thereof where patients or guests are housed.

EXCEPTIONS: Unless otherwise required, this section shall not apply to:

1. Jails, prisons or reformatories.
2. Buildings of Type I construction which were under construction or in existence on March 4, 1972.
3. Hospitals, homes, nurseries, institutions, or sanitariums which were under construction or in existence and operating on March 4, 1972. These may operate or continue to operate without complying until June 30, 1976.
4. Homes or institutions for the care of ambulatory children, provided:

A. The buildings or portions thereof in which such children are housed are not more than two stories in height and

are constructed and maintained in accordance with the regulations adopted by the State Fire Marshal.

B. The buildings or portions thereof housing more than six such children shall have installed and maintained in an operable condition therein a fire alarm system of a type approved by the State Fire Marshal. Such system shall be activated by detectors responding to invisible products of combustion other than heat.

C. The buildings or portions thereof do not house mentally ill or mentally retarded children.

SEC. 91.0908 — SPECIAL HAZARDS

(a) **Gas Shutoff.** Every gas service shall be equipped with a shutoff device conspicuously marked and which is located in an accessible place outside the building.

> SEC. 91.0909 — FIRE SAFETY STANDARDS FOR EXISTING SUBGROUP D-3 OCCUPANCIES

Every existing Subgroup D-3 Occupancy over two stories in height which does not conform to the minimum existing, shaft enclosure and corridor protection requirements of this Code shall be made to conform to the minimum requirements as specified in Section 91.1302.◀

DIVISION 10 — GROUP E OCCUPANCIES†

SEC. 91.1001 — GENERAL**

(a) **Scope.** In addition to the general requirements of Division 5 of this Article, every building or structure housing a Group E Occupancy shall conform to the requirements of this Division.

(b) **Classification.** Every room or structure housing hazardous materials as defined in Section 91.1005 of this Article shall be classified in the appropriate Subgroup as provided in Section 91.1020 of this Article.

EXCEPTIONS: 1. Any building housing less than the exempt amounts of those materials shown in Table No. 10-A shall not be classified as a Group E Occupancy.

2. ➤ Rooms conforming to the requirements for "Special Rooms for Hazardous Materials" as set forth in Division 41 of this Article shall not be classified as a Group E Occupancy. ◀

3. Rooms containing flammable liquids in tightly closed containers of one gallon capacity or less for retail sale or private use on the premises and in quantities not exceeding two gallons per square foot of room floor area shall not be classified as a Group E Occupancy.

4. Rooms used in the preparation or storage of food products for retail sale on the premises shall not be classified as a Group E Occupancy.

5. Rooms where flammable liquids are dispensed, used or stored as incidental to an F Occupancy shall not be classified as a Group E Occupancy.

6. The requirements of this Division shall not apply to the use, production or storage of hazardous materials in an adequately separated installation at which fire protection and emergency facilities especially adopted to the needs are available and the Department determines that by reason of such isolation and protection public safety is assured and no unreasonable hazard will result to persons or property. Each request for a Department determination shall be accompanied by a recommendation from the Fire Department.

7. The following uses shall not be classified as a Group E Occupancy:

a. Drug Stores.

b. Hardware Stores.

c. Retail Paint Sales Rooms with quantities of paints not exceeding two gallons per square foot of room area.

d. Retail Liquor Stores.

e. The storage or use of materials or agricultural property for use on the premises.

f. Closed systems housing combustible liquids used for operation of machinery or equipment.

g. (1) Cleaning establishments which utilize a flammable liquid solvent having a flash point of 140°F or higher in closed systems employing equipment listed by Underwriters Laboratories, provided this use is separated from all other areas of the building by a one-hour occupancy separation.

†Section numbers are not consecutive in this Division, to permit addition of new Sections as required. **See footnote under Sec. 91.1071.

*See Special Hazards Group, Section 91.0509.

(2) *Cleaning establishments which utilize a liquid solvent having a flash point at or above 200°F.*

*h. Refrigeration Systems.**

(c) **Multiple Occupancy.** Every building shall be classified in the most restrictive occupancy housed therein for the purposes of area limitation and each portion comprising a distinct occupancy shall conform to all requirements for that occupancy.

EXCEPTION: *The most restrictive occupancy classification shall not apply to the entire building where accessory Group E Occupancy areas within the building do not exceed the amounts set forth in Table No. 10-D. Each Group E Occupancy area shall comply with all requirements for that occupancy. Occupancy separations shall be provided as required by Section 91.1030.*

TABLE NO. 10-A — EXEMPT AMOUNTS OF HAZARDOUS MATERIALS

	Storage, Manufacture, Process, or Use E, F, & G Occupancies
Flammable Liquids	
Class A	60 Gal.
Class B	120 Gal.
Class C	180 Gal.
Class D	240 Gal.
Combustible Liquids	500 Gal.
Combination of Flammable Liquids with not more than the exempt amounts of Class A, B, or C Flammable Liquids	240 Gal.
Flammable Gases	3,000 cu. ft. at 1 atmosphere of pressure at 70°F
Liquefied Flammable Gases	60 Gal.
Flammable Dusts	See Section 91.1020
Flammable Fibers	
Loose	100 Cu. Ft.
Baled	1,000 Cu. Ft.
Flammable Solids	500 pounds
Dangerous Chemicals	
Explosive Materials	See Section 91.1020
Unstable Materials	No exemptions

NOTE: The amounts of each material indicated above shall not include materials located within any Special Room for Hazardous Materials conforming to the requirements for Division 41 of this Article.

(d) **Modifications.** Any person may appeal to the Board for modification of this Division as permitted by Section 91.0301. The appeal shall present evidence that the modification is in conformity with the spirit and purpose of the ordinance and shall be accompanied by the recommendation of the Fire Department.

SEC. 91.1005 — DEFINITIONS

For the purposes of this Division, certain terms are defined as follows:

Flammable Dust. Any solid material sufficiently comminuted

for suspension in still air which, when so suspended, is capable of self-sustained combustion.

Flammable Fiber. Any free burning material in a fibrous or shredded form such as: cotton, sisal, rayon, henequin, ixtle, jute, hemp, tow, cocoa fiber, oakum, kapok, Spanish moss, excelsior, shredded paper and other materials of a similar nature.

Combustible Liquid. Any liquid having a flash point of 150° F. or more but less than 600° F.

Dangerous Chemical. Any substance which is dangerous to life, limb, or property while being processed, stored or transported, when so designated in Article 7, Chapter 5, of the Los Angeles Municipal Code.

Explosive Material. Any dangerous chemical classified as an explosive material by Article 7, Chapter 5, of the Los Angeles Municipal Code.

Flammable Gas. Any gas having a flammability range with air greater than 1 % by volume.

Flammable Liquid. Any liquid having a flash point below 150° F. and a vapor pressure not greater than 27 p.s.i. (absolute) at 100° F. Flammable liquids shall be divided into four classes as follows:

Class A. Flammable liquids having a flash point below 70° F. and a vapor pressure greater than 14.7 p.s.i. (absolute) but not greater than 27 p.s.i. (absolute) at 100° F.

Class B. Flammable liquids having a flash point below 70° F. and a vapor pressure not greater than 14.7 p.s.i. (absolute) at 100° F.

Class C. Flammable liquids having a flash point of 70° F. or greater but less than 100° F.

Class D. Flammable liquids having a flash point of 100° F. or greater but less than 150° F.

Flash Point. For the purpose of this Division, the flash points of liquids shall be determined in the manner required by the relevant standards of the American Society for Testing and Materials as hereinafter provided.

For the purpose of flash point determinations, fuel oil shall be any liquid petroleum product or liquefiable petroleum product burned for the generation of heat in a furnace or fire box, or burned for the generation of power in an engine, exclusive of oils with a flash point 100° F. determined in the manner required in Standard D56 of the American Society for Testing and Materials, and exclusive of oils burned in cotton or woolwick burners.

The flash points of all flammable or combustible liquids defined herein as fuel oils shall be determined in the manner required in Standard D93 of the American Society for Testing And Materials.

The flash points of all flammable or combustible liquids, other than fuel oils, having flash points below 175° F. when determined in the manner required in Standard D56 of the American Society for Testing And Materials shall be determined as provided in said standard.

The flash points of all combustible liquids, other than fuel oils, having flash points of 175° F. or above when determined in the manner required in Standard D92 of the American Society for Testing And Materials shall be determined as provided in said standard.

Hazardous Material. Any material included under the definitions of Flammable Dust, Flammable Fiber, Combustible Liquid,

Dangerous Chemical, Flammable Gas, Liquefied Flammable Gas, and Flammable Liquid.

Liquefied Flammable Gas. Any liquid or gas which is a liquid while under pressure and having a vapor pressure in excess of 27 pounds per square inch absolute at a temperature of 100° F. and a flammability range with air greater than 1% by volume.

Unstable Material. Any dangerous chemical classified as an Unstable Material by Article 7, Chapter 5 of the Los Angeles Municipal Code.

SEC. 91.1010 — HEATED FLAMMABLE AND COMBUSTIBLE LIQUIDS

A combustible liquid heated to within 50° F. of the flash point, but not higher than the flash point, shall be regulated as a Class D flammable liquid.

A combustible liquid or a Class C or D flammable liquid heated to a temperature higher than the flash point and having a vapor pressure not greater than 14.7 p.s.i. (absolute) at the temperature to which it is heated shall be regulated as a Class B flammable liquid.

A combustible liquid or a flammable liquid heated to a temperature such that the vapor pressure is above 14.7 p.s.i. (absolute) shall be regulated as a liquefied flammable gas.

SEC. 91.1020 — DEFINITIONS OF E OCCUPANCY SUBGROUPS

Every room housing a Group E Occupancy shall be classified in one of the following Subgroups:

(a) Subgroup E-1. Every room housing a Group E Occupancy where:

1. Class A or B flammable liquids in aggregate quantities exceeding exempt amounts shown in Table No. 10-A are stored, manufactured, processed, or used in open containers or open systems;

2. Unstable materials in any amount are manufactured, processed, or used;

3. Explosive materials in any amount are manufactured, processed, or used and wherein there is more than 10 pounds of explosive materials located on the premises at any one time;

4. Flammable gases or liquefied flammable gases in aggregate quantities exceeding exempt amounts shown in Table No. 10-A at any time are manufactured, processed, or used.

(b) Subgroup E-2. Every room housing a Group E Occupancy where:

1. Class A or B flammable liquids in aggregate quantities exceeding exempt amounts shown in Table No. 10-A are manufactured, processed, or used in closed containers or closed systems;

2. Class C or D flammable liquids in aggregate quantities exceeding exempt amounts shown in Table No. 10-A are stored, manufactured, processed, or used in open containers or open systems;

3. Flammable dust is in suspension in the air continuously or intermittently from use, manufacturing, processing or bulk storage operations;

4. Unstable materials in any amount are stored;

5. Flammable gases or liquefied flammable gases in aggre-

gate quantities exceeding exempt amounts shown in Table No. 10-A are stored.

(c) Subgroup E-3. Every room housing a Group E Occupancy where:

1. Class A or B flammable liquids in aggregate quantities exceeding exempt amounts shown in Table No. 10-A are stored in closed containers or closed systems without dispensing;

2. Class C or D flammable liquids in aggregate quantities exceeding exempt amounts shown in Table No. 10-A are stored, manufactured, processed, or used in closed containers or closed systems;

3. Combustible liquids in aggregate quantities exceeding exempt amounts shown in Table No. 10-A are stored, manufactured, processed or used;

4. Loose flammable fibers in aggregate quantities exceeding 100 cubic feet are stored, processed, or used; or where baled or packaged flammable fibers in aggregate quantities exceeding 1,000 cubic feet are stored with fibers partially or totally exposed.

5. Class D flammable liquid solvents are used in a dry cleaning process in closed systems.

TABLE NO. 10-B — OCCUPANCY SEPARATIONS

Group	A	B	S	D	E-1	E-2	E-3	F	G	H	R	J
E-1	4	4	4	4	—	1	2	2	2	4	3	2
E-2	4	4	4	4	1	—	1	1	1	4	3	1
E-3	4	2	2	4	2	1	—	1	1	3	2	1

LEGEND: 4—Four-hour Separation
3—Three-hour Separation

2—Two-hour Separation
1—One-hour Separation

SEC. 91.1030 — SEPARATION OF OCCUPANCIES

Every E Occupancy Subgroup shall be separated from every other occupancy as set forth in Table No. 10-B.

Occupancy separations shall conform to the requirements of Section 91.0503 (a), (b) and (c). The exceptions permitted under Section 91.0503(d) shall not be applicable.

***EXCEPTION:** G Occupancy accessory areas not exceeding 400 square feet may be located within a Group E Occupancy without providing an occupancy separation.*

SEC. 91.1035 — SEPARATION OF USE AND STORAGE WITHIN A BUILDING

Storage of any Hazardous Material in excess of eight hours' supply shall be separated from the use or processing of that material or the use or processing of any other Hazardous Material by at least a one-hour fire-resistive occupancy separation but not less than any required occupancy separation.

SEC. 91.1040 — EXITS

(a) **Number of Exits.** Every room housing a Group E Occupancy shall be provided with two exits if any portion of the room is more than 15 feet distant from a single exit.

Every room housing a Subgroup E-1 Occupancy shall have sufficient exits such that no portion of the room is more than 75 feet from an exit.

(b) **Exit Doors and Locks.** Doors and locks shall conform to

the requirements of Division 33 of this Article except as modified by this Subsection.

Where two exits are provided, a single sliding door not exceeding four feet in width may be used for one exit door serving a Subgroup E-2 or E-3 Occupancy not exceeding 1,000 square feet in area.

(c) **Exits Through Adjacent Occupancies.** Rooms housing Group E Occupancies may exit through adjacent E-2, E-3, F, G, or J Occupancies, provided the required occupancy separation is maintained. A room housing a Subgroup E-1 Occupancy shall not be used as a means of egress for any room other than an adjoining E-1 Occupancy.

SEC. 91.1051 — EXTERIOR WALL AND OPENING PROTECTION

Exterior walls shall have the degree of fire resistance and exterior openings shall have the protection as set forth in Table No. 10-C.

EXCEPTION: Structures conforming to the requirements of Section 91.1065 are exempt from the requirements of this Section unless otherwise provided therein.

TABLE NO. 10-C — EXTERIOR WALL AND OPENING PROTECTION

EXTERIOR WALLS			PROTECTION OF OPENINGS	
Occupancy Group	Time (Hrs.)	Distance to Property Line or Opposite Side of a Public Way	Fire Assembly Required Hour Rating	Distance to Property Line or Opposite Side of a Public Way
E-1	4	Less than 10'	No openings*	Less than 10'
	2	10' to less than 30'	1½	10' to less than 30'
	1	30' to less than 60'	¾	30' to less than 60'
E-2	2	Less than 5'	No openings*	Less than 5'
	1	5' to less than 10'	¾	5' to less than 10'
E-3	1	Less than 10'	No openings* ¾	Less than 5' 5' to less than 10'

*Division wall openings are permitted as set forth in Section 91.0508 (J).

TABLE NO. 10-D — ALLOWABLE AREAS IN SQUARE FEET FOR GROUP E OCCUPANCIES

Type of Construction	Basic Allowable Building Area for Buildings One Story in Height	Aggregate Total of Accessory E Occupancy Areas for All Floors
I	40,000	15,000
II	20,000	9,000
III	10,000	6,000
III-A	7,500	3,500
III-B	7,500	3,500
IV	7,500	3,500
V	4,000	2,000

SEC. 91.1052 — AREA LIMITATION

(a) **Basic Area.** Every building housing a Group E Occupancy shall be limited in basic area as set forth in Table No. 10-D except when only a portion of the building is classified as a Group E Occupancy under the provisions of Section 91.1001 (c). Such portion shall be limited as set forth in Table No. 10-D for accessory Group E Occupancy Areas.

(b) **Area Increases.** The applicable provisions of Section 91.0506 shall apply to Group E Occupancies. The increase of floor areas for public space, streets or yards shall not apply when other provisions of this Code require such separation.

(c) **Repealed.**

SEC. 91.1061 — GENERAL CONSTRUCTION REQUIREMENTS

(a) **Basements.** No Group E Occupancy shall be located in a basement where any required basement exit termination is more than four feet above the basement floor elevation.

EXCEPTION: Equipment used for the transportation of flammable dusts and fibers may extend below the ground level into pits or other areas provided such pits or areas are not used for any other purpose.

(b) **Protection of Supporting Members.** Every structural member within a building providing vertical support for any tank or vessel containing hazardous materials in a liquid form and exceeding 120-gallon capacity shall be of incombustible construction and shall have at least two-hour fire-resistive protection or be sprinklered.

EXCEPTION: Protection of supports for tanks or vessels having a capacity of not more than 600 gallons need only extend to the floor surface of the floor upon which they are supported.

(c) **Draft Stops.** Draft stops shall be provided for any pitched or arched roof without a ceiling and any sloping ceiling where the rise of the roof or ceiling is in excess of five feet, so that no horizontal area exceeds 5,000 square feet between draft stops. Draft stops shall be of tight incombustible finish material and shall extend to the lowest level of the roof or ceiling to be divided but need not exceed a depth of 10 feet. Areas between draft stops shall have permanently open or automatically operated ventilators equal in area to $\frac{1}{4}$ of 1% of the area served. Automatic devices shall be designed to operate at temperatures of 165 degrees Fahrenheit or less. Ventilators shall be located within five feet of the highest portion of the roof or ceiling between draft stops.

EXCEPTION: Draft stops will not be required where the roof is of incombustible construction and ventilators are located at the high point of the roof and have an aggregate area equal to 1% of the floor area served.

(d) **Conveyor Openings.** Openings in floors or walls forming occupancy separations or division walls shall be permitted for the purposes of conveyor and equipment systems where the required fire door protection is impractical. Such openings shall be provided with a fire sprinkler system where the opening does not exceed nine square feet in area and is located in a one-hour or two-hour fire-resistive separation or a two-hour division wall. Openings in such walls in excess of nine square feet and openings in a three-hour or four-hour fire-resistive separation or a four-hour division wall shall be provided with an incombustible tunnel extending six feet on each side of a wall

opening and six feet below the ceiling for a floor opening and shall be provided with a fire sprinkler system.

SEC. 91.1063 — OCCUPANCY CONSTRUCTION REQUIREMENTS

(a) **Subgroup E-1 Occupancies.** Every Subgroup E-1 Occupancy shall be sprinklered and in addition shall be of not less than one-hour fire-resistive construction or incombustible construction throughout or a combination thereof.

EXCEPTION: Buildings housing explosive materials and conforming to Section 91.1071 are exempt from the requirements of this Subsection.

(b) **Subgroup E-2 Occupancies.** Every Subgroup E-2 Occupancy shall be of not less than one-hour fire-resistive construction or incombustible construction throughout, or a combination thereof.

EXCEPTIONS: 1. Exposed wood roof sheathing, trusses, beams, or rafters shall be permitted where such construction is 25 feet or more above the floor.

2. One-hour or incombustible construction shall not be required where the Group E Occupancy area is sprinklered throughout and the sprinklers are not required for an area increase by the provisions of Section 91.1052 (b).

SEC. 91.1065 — TANKS, STORAGE AND PROCESSING STRUCTURES NOT LOCATED WITHIN A BUILDING

(a) **Explosive Materials.** Structures used for the storage, manufacture, processing or use of an explosive material shall conform to the requirements of Section 91.1071.

(b) **Flammable Dusts.** Effective venting devices equal in area to one square foot for each 80 cubic feet of volume shall be provided for every flammable dust collection and storage structure exceeding a volume of 250 cubic feet.

Venting devices shall be of light incombustible construction and shall be located in the roof or in one or more walls facing yards of 30 feet or more in width.

(c) **Other Hazardous Materials.** Structural members providing vertical support for tanks or vessels containing hazardous materials in a liquid form and having a capacity exceeding 600 gallons shall be of incombustible construction and shall have at least one-hour fire-resistive protection or be sprinklered.

EXCEPTIONS: 1. Fire-resistive protection shall not be required on the inside surface of skirts if all openings except one are protected by steel covers of the same thickness as the skirt.

2. Tanks or vessels of 1,200 gallon capacity or less may be installed with non-fireproofed steel supports, provided the bottom of the container is not more than two feet above the adjacent ground elevation.

(d) **Isolation.** Processing structures other than tanks, cylinders, pressure vessels or other containers shall comply with the exposure requirements of Section 91.1051.

EXCEPTION: This isolation shall not be required between structures located on the same site or between buildings incidental to the operation of the structure.

*See footnote under Section 91.1071.

SEC. 91.1067 — MECHANICAL* VENTILATION

(a) General. Mechanical ventilation systems used to provide required ventilation for rooms housing hazardous materials shall conform to the requirements set forth in this Section.

(b) Distribution of Openings. Intake and exhaust openings shall be distributed so as to assure a uniform movement of air over the entire room area.

(c) Location of Openings. Systems serving flammable gases consisting primarily of materials heavier than air, or flammable liquids shall have the bottom of exhaust openings located between six inches and 12 inches above the floor. Intake openings for such systems shall be located in the ceiling or within 12 inches of the ceiling.

Systems serving flammable gases consisting primarily of materials lighter than air shall have exhaust openings located in the ceiling or within 12 inches of the ceiling and shall have the bottom of the intake openings located not more than 12 inches above the floor.

(d) Repealed.

SEC. 91.1068 — GRAVITY VENTILATION

(a) General. Gravity ventilation systems used to provide required ventilation for rooms housing hazardous materials shall conform to the requirements of this Section.

(b) Exterior Wall Vents. Permanently open floor and ceiling vents shall be provided in at least two exterior walls except that vents shall be required in only one exterior wall where all portions of the floor area are within 10 feet of the exterior wall providing the required ventilation. Where two exterior walls are required for ventilation, the aggregate length of the two walls shall be at least 40 percent of the perimeter of the room. Exterior walls containing vents shall face yards of sufficient width as set forth in Table No. 10-C to permit unprotected or openings protected by a fire assembly having a three-fourths hour fire-resistive rating. Ceiling vents may be located in the ceiling or the exterior wall.

(c) Size and Location. The total aggregate area of all vents shall be not less than 2% of the floor area of the room. Each vent shall have a minimum area of 72 square inches. The required vent area shall be distributed approximately equally between floor and ceiling vents. The bottom of floor vents shall be located not less than six inches nor more than 12 inches above finished floor level. Ceiling vents shall be located in the ceiling or shall be located in the exterior walls within 12 inches of the ceiling.

(d) Spacing. Vents in exterior walls shall be spaced not more than 10 feet apart and at least one floor vent shall be located within six feet of each end of every exterior wall containing vents. Vents in the ceiling shall be spaced not more than 10 feet apart along the longest dimension of the room.

(e) Repealed.

SEC. 91.1069 — CONSTRUCTION REQUIREMENTS FOR VENTILATING SYSTEMS

(a) General. Every duct used in connection with a gravity or mechanical system of ventilation shall conform to the requirements of this section.

(b) Construction. Duct construction shall conform to the requirements of the Heating, Ventilating and Air Conditioning Code.

(c) **Location of Exhaust Outlets.** Duct outlets shall be located as set forth in Division 5 of the Heating and Ventilating Code.

(d) **Attic Protection.** Ducts extending through an attic space constructed of combustible materials shall be protected with:

1. $\frac{3}{4}$ -inch plaster over metal lath, or;
2. $\frac{1}{2}$ -inch of asbestos mill board securely attached with incombustible straps, or;
3. Two inches of solidly packed inert filler material held in place throughout the length of the duct by an incombustible covering. If wire netting is used, the mesh shall not be larger than $1\frac{1}{2}$ -inch.

(e) **Duct Enclosures.** Every ventilation opening in an interior wall or floor of a story above shall be connected to an enclosed duct extending to the outside air. The duct enclosures shall be of at least one-hour fire-resistive construction, but not less than any required occupancy separation. Duct protection as set forth in Subsection (d) above for attics may be used wherever a one-hour fire-resistive enclosure is required.

SEC. 91.1070 — ELECTRICAL PROTECTION

All electrical equipment and wiring located within or adjoining any room or portion of a building or structure housing hazardous materials shall be installed as required by the Electrical Code for the class of hazard involved.

SEC. 91.1071 — SPECIAL REQUIREMENTS FOR EXPLOSIVE MATERIALS*

(a) **Scope.** In addition to the occupancy and general requirements of this Division, buildings or structures used for the storage, manufacturing, processing, or use of explosive materials shall conform to this Section.

(b) **Exclusive Use.** Every building or structure housing explosive materials shall be used exclusively for that purpose.

(c) **Storage.** No building or structure other than an explosives vault shall be used for the storage of explosive materials. Every explosives vault shall conform to the requirements of Division 41 of this Article.

TABLE NO. 10-E — ISOLATING DISTANCES FOR EXPLOSIVE MATERIALS

Amounts Within Building or Structure	Yards Required for Walls Not of Masonry or Concrete Construction †	Yard Required for a Wall of Masonry or Concrete and of at Least Four-Hour Fire-Resistive Construction
10 pounds or less	(See Section 91.1051) 100 Feet†	50 Feet
More than 10 pounds to less than 100 pounds		
100 pounds to 500 pounds	200 Feet†	100 Feet

†Yards may be reduced by one-half between buildings or structures housing Group E Occupancies only, located on the same property, and used entirely by the same owner or lessee.

*The Fire Department should be consulted for use, processing or storage of Hazardous Materials whether or not such use constitutes a Group E Occupancy and for all processes and equipment used in connection with Hazardous Materials.

(d) **Isolation.** Every building or structure housing explosive materials shall be provided with yards on all sides as set forth in Table No. 10-E for the maximum amount of explosive materials to be housed within the building or structure at any one time. Isolation yards shall be measured to the nearest building, nearest separately owned property, or to the nearest public way.

(e) **Explosion Venting.** Effective venting devices equal in area to 50 per cent of the floor area shall be provided for any building used to house Explosive Materials. At least $\frac{1}{2}$ of the required venting area shall be provided in the roof of the building. Venting devices shall be of light incombustible construction.

SEC. 91.1072 — SPECIAL*† REQUIREMENTS FOR UNSTABLE MATERIALS

(a) **Scope.** In addition to the occupancy and general requirements of this Division, every room or portion of a building housing unstable materials shall conform to this Section.

(b) **Liquids.** Any room or portion of a building housing unstable materials in a liquid form shall conform to the requirements for flammable liquids as set forth in Section 91.1073.

(c) **Gases.** Any room or portion of a building housing unstable materials in a gaseous form shall conform to the requirements for flammable gases as set forth in Section 91.1074.

(d) **Solids.** Any room or portion of a building wherein unstable materials in a powdered or finely divided form are stored, manufactured, processed or used and may be in suspension in the air continuously or intermittently shall conform to the requirements for flammable dusts as set forth in Section 91.1076.

SEC. 91.1073 — SPECIAL*† REQUIREMENTS FOR FLAMMABLE LIQUIDS

(a) **Scope.** In addition to the occupancy and general requirements of this Division, every room or portion of a building housing flammable liquids shall conform to this Section.

Flammable liquids utilized by cleaning establishments shall be limited to those liquids with a flash point not lower than that of Class D flammable liquids (100°F).

(b) **Floors.** The floor shall be constructed of concrete or other nonabsorbent incombustible materials.

***EXCEPTION:** Wood floors covered with $2\frac{1}{2}$ inches of concrete reinforced with $1\frac{1}{2}$ inches by No. 17 gage or equivalent wire mesh may be used in lieu of a concrete floor.*

(c) **Ventilation.** Rooms or portions of a building housing flammable liquids shall be provided with ventilation as set forth in this Subsection.

***EXCEPTION:** Any building having 50% or more of the gross wall area entirely open shall not require other means of ventilation.*

1. Subgroup E-1 Occupancies. A mechanical exhaust system of ventilation of sufficient capacity to provide at least 12 complete changes of air per hour within the room shall be provided when flammable liquids are used, processed, or manufactured

*The Fire Department should be consulted for use, processing or storage of Hazardous Materials whether or not such use constitutes a Group E Occupancy and for all processes and equipment used in connection with Hazardous Materials.

†For other requirements concerning hazardous chemicals which are toxic see Article 9, Chapter 3 of the Los Angeles Municipal Code and regulations of the Health Commission.

In a Subgroup E-1 Occupancy. Mechanical ventilation systems shall conform to the requirements of Section 91.1067.

2. Subgroup E-2 Occupancies. Either gravity ventilation or a mechanical exhaust system of ventilation shall be provided when flammable liquids are manufactured, processed or used in a Subgroup E-2 Occupancy. The mechanical exhaust system of ventilation shall have sufficient capacity to provide at least six complete changes of air per hour within the room, and shall conform to the requirements of Section 91.1067. Where gravity ventilation is used, the requirements of Section 91.1068 shall apply.

3. Subgroup E-3 Occupancies. Cleaning establishments utilizing chlorinated hydrocarbon solvents, classified in a Subgroup E-3 Occupancy, shall be provided with a mechanical ventilation system that will provide at least 30 complete changes of air per hour.

EXCEPTION: Cleaning establishments in which all dry cleaning processes are performed in fluid-tight machines or apparatus designed, installed, and operated in a manner that will prevent the escape of flammable or toxic vapors, when so approved by the Fire Department, may provide ventilation in accordance with Section 91.1073(c) 1.

SEC. 91.1074 — SPECIAL*† REQUIREMENTS FOR FLAMMABLE GASES

(a) Scope. In addition to the occupancy and general requirements of this Division, every room or portion of a building housing flammable gases shall conform to this Section.

(b) Ventilation. Either gravity ventilation or a mechanical exhaust system of ventilation shall be provided for any room housing flammable gases. The mechanical exhaust system of ventilation shall have sufficient capacity to provide at least six complete changes of air per hour within the room and shall conform to the requirements of Section 91.1067. Where gravity ventilation is used, the requirements of Section 91.1068 shall apply.

SEC. 91.1075 — SPECIAL*† REQUIREMENTS FOR LIQUEFIED FLAMMABLE GASES

(a) Scope. In addition to the occupancy and general requirements of this Division, every room or portion of a building housing liquefied flammable gases shall conform to this Section.

(b) Ventilation. Ventilation shall be provided as set forth in Section 91.1074 for flammable gases.

SEC. 91.1076 — SPECIAL*† REQUIREMENTS FOR FLAMMABLE DUSTS

(a) Scope. In addition to the occupancy and general requirements of this Division, every room or portion of a building wherein flammable dusts are stored, manufactured, processed or used and may be in suspension in the air continuously, or intermittently shall conform to this Section.

(b) Construction. Wall and ceiling surfaces shall be smooth. Ledges shall be beveled at 60 degrees to the horizontal to prevent the accumulation of dust.

(c) Dust Collection System. Every dust producing process shall be provided with a dust collection system adequate in capacity to prevent hazardous concentrations of dust within the room.

(d) Explosion Venting. Effective venting devices equal in area to at least one square foot for each 80 cubic feet of volume shall

be provided for every flammable dust collection or storage container having a volume exceeding 250 cubic feet.

The venting devices shall be of light incombustible construction and shall vent directly to the exterior of the building. Venting devices shall be located in the roof or in walls facing yards 30 feet or more in width.

SEC. 91.1077 — SPECIAL*† REQUIREMENTS FOR FLAMMABLE FIBERS

(a) **Scope.** In addition to the occupancy and general requirements of this Division, every room or portion of a building housing flammable fibers shall conform to this Section.

(b) **Construction and Fiber Collection System.** Every room housing a use or process involving flammable fibers wherein flammable particles are suspended in air shall comply with the requirements of Subsections (b) and (c) of Section 91.1076 for flammable dusts.

SEC. 91.1078 — SPECIAL REQUIREMENTS FOR COMBUSTIBLE LIQUIDS

(a) **Scope.** In addition to the occupancy and general requirements of this Division, every room or portion of a building housing combustible liquids shall conform to this Section.

(b) **Floors.** The floor shall be constructed of concrete or other nonabsorbent incombustible material.

EXCEPTION: *Wood floors covered with 2½ inches of concrete reinforced with 1½ inches by No. 17 gage or equivalent wire mesh may be used in lieu of a concrete floor.*

*The Fire Department should be consulted for use, processing or storage of Hazardous Materials whether or not such use constitutes a Group E Occupancy and for all processes and equipment used in connection with Hazardous Materials.

†For other requirements concerning hazardous chemicals which are toxic see Chapter 3 of the Los Angeles Municipal Code and regulations of the Public Health Code of the County of Los Angeles.

DIVISION 11 — GROUP F OCCUPANCIES

SEC. 91.1101 — GROUP F OCCUPANCIES DEFINED

Subgroup F-1: Every heliport and every room in which flammable liquids in lots of more than one gallon are dispensed for use in motor vehicles or in which motor vehicles are repaired or stored, unless classified as a Subgroup F-1P, Group S or Group J Occupancy.

Subgroup F-1P: An open parking garage structure of Type I, II, or IV construction which is open on two or more sides totaling not less than 40 percent of the building perimeter and which is used exclusively for the parking or storage of passenger motor vehicles having a capacity of not more than nine persons per vehicle. For a side to be considered open, the total area of openings distributed along the side shall be not less than 50 percent of the exterior area of the side at each tier.

SEC. 91.1102 — CONSTRUCTION, HEIGHT AND AREA

(a) General. Buildings or portions thereof used for Group F Occupancies shall conform to the general requirements of Division 5 and to the requirements of this Division.

EXCEPTION: Any other provisions of this Code notwithstanding, a Subgroup F-1 Occupancy located in the basement or first story of a building housing a Group G or H Occupancy may be classed as a separate and distinct building for the purpose of area limitations and type of construction, provided:

1. There is a three-hour occupancy separation between all portions of the Group G or H Occupancy and a Subgroup F-1 Occupancy;

2. The Subgroup F-1 Occupancy is devoted solely to the storage of passenger vehicles.

Every Group F Occupancy in an upper story shall be housed in a Type I or II building except Subgroup F-1P Occupancies may be located in a Type IV building as set forth in Section 91.1109.

(b) Special Provisions. Every floor in every room housing a Group F Occupancy and any floor or roof supporting a Group F Occupancy, including all members supporting such floor or roof, shall be of incombustible material.

EXCEPTION: Asphaltic concrete having a minimum thickness of two inches may be used for the floor of any room which is not used for repair of motor vehicles or for dispensing of fuel and which is not located in the upper story of a Type IV building.

No floor used for the repair of motor vehicles, except for service or grease pits, shall be lower than that portion of the public way used for the entrance to the first story of the building.

Any portion of a building used for parking, storing, repairing or servicing of any motor vehicles shall have a clear height of not less than six feet, six inches.

EXCEPTION: Storage compartments, construction, or equipment may extend down to a point four feet, six inches above the finished floor of the garage for a maximum horizontal distance of four feet over the portion of any required park-

ing space occupied by the hood of an automobile. Such reduced height shall not be allowed in areas subjected to pedestrian travel.

SEC. 91.1103 — LOCATION ON PROPERTY

Exterior walls, of Subgroup F-1 Occupancies, other than repair garages, within five feet of and facing a property line shall be of two-hour fire-resistive construction without openings. Exterior walls of repair garages shall have such construction, without openings, for all walls within ten feet of and facing a property line.

Exterior walls of Subgroup F-1 Occupancies, other than repair garages, within 10 feet of and facing a property line shall be of one-hour fire-resistive construction with all openings in such walls protected by not less than three-fourths hour fire-resistive assemblies. Exterior walls of repair garages shall have such construction and opening protection for all walls within 20 feet of and facing a property line.

For the purpose of this Section, repair garages are defined as those occupancies performing major engine overhaul, transmission repair, work on vehicles exceeding one-ton capacity or any other work requiring the use of open-flame, flammable liquids or welding.

Wall vents not exceeding 100 square inches in area and not more than 12 inches above the floor need not be equipped with fire protection assemblies.

SEC. 91.1104 — EXITS

Stairs and exits shall be provided as set forth in Division 33.

EXCEPTION: In Subgroup F-1P Occupancies where no person other than a parking attendant is permitted, there shall not be less than two stairways of three-foot width.

SEC. 91.1105 — VENTILATION AND SANITARY FACILITIES

(a) **Ventilation.** Every Group F Occupancy shall be provided with a mechanical system of ventilation providing uniform movement of air sufficient to produce one complete change of air every 15 minutes. Where a mechanical exhaust system is used, the exhaust ventilation shall be taken at a point within 18 inches of the floor level. Every duct shall be protected and maintained so that designed capacities shall not be impaired. Ventilation duct openings shall be spaced not farther than 50 feet apart around the perimeter of the room.

EXCEPTIONS: 1. Ventilation of Subgroup F-1P Occupancies, other than the openings specified in Section 91.1101, shall not be required. Basements of Subgroup F-1P Occupancies which are not at least 50 percent open on two or more sides shall not be excepted.

2. Mechanical ventilation may be omitted from a room in the following cases:

A. Any room having a total of one square inch of ventilating area to each 10 square feet of floor area in the room, where such ventilation is equally distributed in two opposite walls. Ventilators shall be spaced not more than 10 feet apart, open directly to the exterior of the building and all portions shall be within 18 inches of the floor. The ventilators may be omitted from one wall if that wall has permanent openings equal to 2½ percent of the floor area. Permanent openings shall not be covered except by insect screening.

B. Any room having permanent openings in two oppo-

site exterior walls or, if two opposite walls are not available, permanent openings located as far apart as possible in two adjoining exterior walls. The areas of openings in each wall shall be equal to not less than 2½ percent of the floor area. One-half of the area of permanent openings shall be located in the roof if only one wall is available. Permanent openings shall not be covered except by insect screening.

C. Where the longer side of an exterior wall of a building is 50 percent open and the openings are uniformly distributed.

Exhaust duct outlets shall be located as set forth in Division V—Ventilation Systems, of the Heating, Ventilating, Air Conditioning and Refrigeration Code in Article V of Chapter IX.

(b) **Sanitary Facilities.** Sanitary facilities shall be provided as set forth in Section 91.0512.

SEC. 91.1106 — ENCLOSURE OF VERTICAL OPENINGS

Every opening in a floor shall be enclosed as required by Division 17 for shaft enclosures. Enclosures for exits shall also comply with the requirements of Division 33.

SEC. 91.1107 — FIRE EXTINGUISHING SYSTEMS

In any building, every story or tier classified as a Group F Occupancy and having a floor surface elevation more than four feet lower than the highest elevation of the floor, landing, or tread of any required exit from that story or tier shall be sprinklered.

SEC. 91.1108 — SPECIAL HAZARDS

➤ Boiler rooms shall conform to the requirements of Division 41. ◀

SEC. 91.1109 — OPEN PARKING GARAGES

(a) **Scope — Applicable Code Sections.** An open parking garage shall comply with all applicable requirements of this Code except where specific provisions are made in this Section.

(b) **Access and Tiers.** Open parking garages are further classified as either ramp-access or mechanical-access. Ramp-access open parking garages are those employing a series of continuously rising floors or a series of interconnecting ramps between floors permitting the movement of vehicles under their own power from and to grade. Mechanical-access parking garages are those employing parking machines, elevators or other mechanical devices for the movement of vehicles above or below the grade level.

A tier is a parking surface or parking level, including a roof, if so usable. In structures having a spiral or sloping floor the number of tiers is the number of parking levels intersected by a vertical line beginning at the lowest level and including the top parking surface.

(c) **Construction.** Construction shall be of incombustible materials. Basements shall be of Type I or II construction and shall be separated from the rest of the building by a two-hour fire-resistive separation. The required wall openings shall be uniformly distributed in each tier.

EXCEPTION: Openings shall not be required in the exterior walls of basements.

(d) **Area and Height.** The area and height of open parking garages shall be limited as set forth in Table No. 11-A.

The maximum allowable total tier area shall be that computed

by multiplying the maximum allowable number of tiers by the maximum allowable area per tier.

In structures having a spiral or sloping floor, the horizontal projection of the structure at any horizontal cross-section shall not exceed the allowable area per parking tier.

The clear height of a parking tier shall be not less than seven feet, except that a lesser clear height may be permitted in mechanical access open parking garages when approved by the Department.

(e) **Area and Height Increases.** Area and height increases shall be permitted only as specified in this Subsection.

Areas of structures open on three sides, when such three sides comprises three-fourths of the building perimeter, may be increased 25 percent and one tier in height. Areas of structures open on four sides may be increased 50 percent and one tier in height.

Open parking garages constructed to heights less than the maximums established by Table No. 11-A may have individual tier areas exceeding those otherwise permitted, provided the gross tier area of the structure does not exceed that permitted for the higher structure. At least three sides of each such larger tier shall have continuous horizontal openings not less than 30 inches clear height extending for at least 80 percent of the length of the sides and no part of such larger tier shall be more than 200 feet horizontally from such an opening. In addition, each such opening shall face a street, or yard accessible to a street, with a width of at least 30 feet for the full length of the opening; and standpipes shall be provided in each such tier.

Portions of buildings completely separated by division walls complying with Division 5 shall be considered as separate buildings for purposes of area limitations.

(f) **Location on Property.** Exterior walls within 10 feet of and facing a property line shall be of two-hour fire-resistive construction without openings.

Exterior walls within 20 feet of and facing a property line shall be of one-hour fire-resistive construction without openings.

(g) **Enclosure of Vertical Openings.** Enclosures shall not be required for vertical openings except as specified in Section 91.1104, Division 17 and 33, for basements, stairs and exits.

(h) **Fire-Extinguishing Systems.** Standpipes shall be provided as required by Division 5.

(i) **Accessory Uses.** The grade level tier may contain an office, waiting and toilet rooms having a total area of not more than 1000 square feet and such area need not be separated from the open parking garage.

**TABLE NO. 11-A — OPEN PARKING GARAGES —
AREA AND HEIGHT**

TYPE OF CONSTRUC- TION	MAXIMUM AREA PER TIER (Square Feet)	HEIGHT—MAXIMUM NUMBER OF TIERS		
		Ramp-Access	Mechanical-Access	
			Unsprinklered	Sprinklered
I	Unlimited	Unlimited	Unlimited	Unlimited
II	75,000	10	12	18
IV-1 Hour	50,000	8	10	15
IV-N	30,000	6	8	12

NOTES:

1-Hour — Not less than one hour fire-resistive construction throughout.

N — No general requirements for fire resistance.

DIVISION 13 — GROUP H OCCUPANCIES

SEC. 91.1301 — GENERAL

(a) **Scope.** In addition to the general requirements of Division 5, Group H Occupancies shall conform to the requirements of Division 49 of this Article.

SEC. 91.1302 — FIRE SAFETY STANDARDS FOR EXISTING GROUP H OCCUPANCIES

(a) **Purpose.** The purpose of this section is to provide a reasonable degree of fire safety for persons living and sleeping in apartment houses, hotels, and apartment hotels by requiring alterations to such existing buildings which do not conform to the minimum exiting, shaft enclosure and corridor protection requirements of this Code.

(b) **Scope.** The provisions of this section apply to all existing buildings more than two stories in height which contain Group H Occupancies. The provisions of this section shall not authorize the modification of existing buildings or portions thereof which provide a greater degree of protection against fire than the minimum requirements established by this section.

(c) **Corridor Walls and Openings.** The walls of every public corridor shall be protected by one-hour fire resistive construction, provided, however, that existing walls constructed of wood-lath and plaster and which are in good condition, will be acceptable in lieu thereof.

Transoms and openings other than doors from public corridors to guest rooms and dwelling units shall be closed and solidly covered with material which will provide the same degree of fire resistiveness as shall be provided by adjacent corridor walls.

All door openings from public corridors to guest rooms and dwelling units shall provide the same degree of fire resistiveness as shall be provided by adjacent corridor walls.

EXCEPTION: Door openings from public corridors to guest rooms and dwelling units may have 20-minute-protection, provided:

1. All stairways, hallways, exitways and storage or closet areas adjacent thereto are sprinklered; and,
2. A sprinkler head is placed inside each unit adjacent to each door opening from the public corridor to the guest room or dwelling unit; and,
3. An approved self-closing device is installed on each door opening from the public corridor into the guest room or dwelling unit.

(d) **Shaft Enclosures.** All stairwells shall be enclosed in approved shaft enclosures, provided however, that existing enclosure walls constructed of wood-lath and plaster which is in good condition will be accepted in lieu of approved shaft wall construction.

EXCEPTIONS: 1. In buildings erected prior to January 1, 1943, stairshaft enclosures may be omitted if all stairways, hallways, exitways and closet or storage areas adjacent thereto are sprinklered. No basement sprinklers will be required by reason of this exception where none exist if one-hour fire resistive partitions with 1½ inch self-closing solid core doors are provided so that a fire originating in the

basement cannot spread directly to any adjoining floor or story. Portions of a building containing occupancies other than Group H Occupancies need not be sprinklered by reason of this exception, provided all such portions are separated from the Group H Occupancies by conforming occupancy separation walls and floors.

2. In buildings erected prior to January 1, 1943, stairshaft enclosures may be omitted if one-hour fire resistive partitions with 1½ inch self-closing solid core doors are placed in all stairwell openings so that a fire originating on any floor or story cannot spread directly to any adjoining floor or story; and provided further that a low voltage fire warning system acceptable to the Fire Department is installed throughout the building in connection with the installation of fire resistive partitions.

(c) **Existing Conditions.** 1. Existing means of exit, including fire escapes, are acceptable where they exist in the required number and are maintained in good condition.

2. No standpipes will be required where none exist.

3. No emergency exitway illumination will be required where none exist.

4. Deadend corridors not over 20 feet in length may have access to a second exit through a stairshaft enclosure.

SEC. 91.1303. EXIT FACILITIES:

➤ (a) **General.** Stairs and exits shall be provided as specified in Division 33.

(b) **Emergency Egress and Rescue.** Every sleeping room below the fourth story shall have at least one operable window or exterior door provided for emergency egress and rescue.

EXCEPTION: Metal bars, grills, grates, or similar devices which would impede emergency rescue may be installed provided: 1. Such metal bars, grills, grates or similar devices are equipped with a quick-release latch operable from the inside without the use of a key, tool or any special knowledge or effort in at least one operable window or exterior door located within the sleeping room; and

2. Detectors of products of combustion other than heat which when actuated provide an alarm within the dwelling unit are installed and maintained in such dwelling unit. Such detectors shall be approved by the Department and State Fire Marshal. All detectors shall be located within 12 inches of the highest ceiling level and at a place which will not interfere with the operation of the detector. A detector shall be located within 15 feet of the door to each room used for sleeping purposes and no obstruction which would prevent the movement of smoke toward the detector shall be located between such doors and the detector. Where sleeping rooms are on an upper level, a detector shall be placed at the center of the ceiling directly above the stairway. In an Efficiency Dwelling Unit, and a Guest Room, the detector shall be centrally located on the ceiling of the main room.

All egress or rescue windows from sleeping rooms shall have a minimum net clear opening of 5.7 square feet. The minimum net clear opening height dimension shall be 24 inches. The minimum net clear opening width dimension shall be 20 inches. The maximum finished sill height shall not be more than 44 inches above the adjacent floor. <

DIVISION 14 — GROUP R OCCUPANCIES**SEC. 91.1401 — GENERAL**

(a) Scope. In addition to the general requirements of Division 5, every Group R Occupancy shall conform to the requirements of this Division.

SEC. 91.1402 — SPECIAL REQUIREMENTS FOR SUBGROUP R OCCUPANCIES

(a) General. Subgroup R Occupancies shall comply with all applicable requirements of Division 49.

(b) Garage Separation. Every wall and ceiling separating an R Occupancy garage from a dwelling shall be protected on the garage side with materials approved for one-hour, fire-resistive construction. Every opening in such wall or ceiling shall be provided with a one-hour, fire-protection assembly. Any door shall be self-closing.

EXCEPTIONS: 1. Doors may be constructed of wood protected with metal not thinner than No. 26 gage. A solid slab door not less than 1½ inches thick need not be metal covered.

2. An R Occupancy garage or carport in a one-story portion of a dwelling needs no fire separation if at least two sides of the garage or carport are completely open except for necessary structural members.

3. One-hour fire-protection assemblies may be omitted from ducts constructed of minimum No. 26 gage galvanized iron and having no openings into the garage area.

(c) Garage Floors. R Occupancy garage floors shall be of portland cement concrete of three inches minimum thickness or asphaltic concrete of not less than two inches in thickness if supported upon the ground. Such floors shall be not less than two inches in thickness if supported upon a structural framework. All materials shall comply with the provisions of this Code.

(d) EXIT FACILITIES: ➤ 1. Stairs and exits shall be provided as specified in Division 33.

Every dwelling three or more stories in height shall have at least two means of egress from every story to a public way or court conforming to an exit court, except for any portion of a building where that portion does not exceed two stories in height.

2. Every sleeping room below the fourth story shall have at least one operable window or exterior door provided for emergency egress and rescue.

EXCEPTION: Metal bars, grills, grates or similar devices which would impede emergency rescue may be installed provided: 1. Such metal bars, grills, grates or similar devices are equipped with a quick-release latch openable from the inside without the use of a key, tool or any special knowledge or effort in at least one operable window or exterior door located within the sleeping room; and

2. Detectors of products of combustion other than heat which when actuated provide an alarm within the dwelling unit are installed and maintained in such dwelling unit. Such detectors shall be approved by the Department and State Fire Marshal. All detectors shall be located within 12 inches of the highest ceiling level and at a place which will not interfere with the operation of the detector. A detector shall be located within 15 feet of the door to each room used for sleeping purposes and no obstruction which would prevent the movement of smoke toward the detector shall be located between such doors and the detector. Where sleeping rooms are on an upper level, a detector shall be placed at the center of the ceiling directly above the stairway.

All egress or rescue windows from sleeping rooms shall have a minimum net clear opening of 5.7 square feet. The minimum net clear opening height dimension shall be 24 inches. The minimum net clear opening width dimension shall be 20 inches. The maximum finished sill height shall not be more than 44 inches above the adjacent floor. ◀

DIVISION 15 — GROUP J OCCUPANCIES

SEC. 91.1501 — GENERAL

(a) **Scope.** In addition to the general requirements of Division 5, every Group J Occupancy shall conform to the requirements of this Division.

SEC. 91.1502 — CONSTRUCTION

(a) **Area Limitations.** Every building housing a Group J Occupancy shall be limited in area as set forth in Division 5 of this Article.

Not more than one Subgroup J-1 Occupancy shall be housed in any building except where separated by division walls. Automobile access through a division wall separating Subgroup J-1 Occupancies shall not be allowed.

(b) **Occupancy Separations.** Every Group J Occupancy shall be separated from any other occupancy as set forth in Division 5 of this Article.

(c) **Floor Construction.** The floor of a Subgroup J-1 Occupancy shall be of cement concrete of three inches minimum thickness or asphaltic concrete of not less than two inches in thickness if supported upon the ground. Such floors shall be not less than two inches in thickness if supported upon a structural framework.

SEC. 91.1503 — LOCATION ON PROPERTY

Every building housing a Group J Occupancy shall have exterior wall protection as set forth in Division 5 of this Article.

SEC. 91.1504 — EXITS

Stairs and exits shall be provided as set forth in Division 33 of this Article.

SEC. 91.1505 — VENTILATION

(a) Every J-1 Occupancy with a capacity of over six cars shall be ventilated as required by Division 11.

(b) Every Subgroup J-1 Occupancy, with a capacity of not over six cars, having an opening into a Group H Occupancy shall be equipped with fixed louvered or screened openings not less than 60 square inches in area for every 200 square feet of floor area within the J-1 Occupancy. Such openings shall be located not more than 12 inches above the floor and shall be located in an exterior wall or connected to a continuous duct leading to the outside air.

(c) Openings between a Subgroup J-1 Occupancy and any room used for sleeping purposes are prohibited.

SEC. 91.1506 — SPECIAL HAZARDS

Flammable liquids shall not be stored, handled or used in Group J Occupancies unless such storage, handling or use is specifically permitted by other provisions of this Article.

DIVISION 16 — FIRE DISTRICT REGULATIONS

SEC. 91.1601 — GENERAL

(a) Fire District No. 1 Boundaries. Fire District No. 1 shall include:

I. Downtown. All of the territory bounded by the following streets or freeways:

1. Harbor Freeway from the Santa Monica Freeway to the Santa Ana Freeway;

2. Santa Ana Freeway from the Harbor Freeway to Alameda Street;

3. Alameda Street from the Santa Ana Freeway to Fourth Street;

4. Fourth Street from Alameda Street to Central Avenue;

5. Central Avenue from Fourth Street to the Santa Monica Freeway;

6. Santa Monica Freeway from Central Avenue to the Harbor Freeway.

II. Hollywood. All of the territory bounded by the following streets:

1. Yucca Street from Highland Avenue to Gower Street;

2. Gower Street from Yucca Street to De Longpre Avenue;

3. De Longpre Avenue from Gower Street to Vine Street;

4. Vine Street from De Longpre Avenue to Fountain Avenue;

5. Fountain Avenue from Vine Street to Wilcox Avenue;

6. Wilcox Avenue from Fountain Avenue to Sunset Boulevard;

7. Sunset Boulevard from Wilcox Avenue to Highland Avenue;

8. Highland Avenue from Sunset Boulevard to Hollywood Boulevard;

9. Hollywood Boulevard from Highland Avenue to Orchid Avenue;

10. Orchid Avenue from Hollywood Boulevard to Franklin Avenue;

11. Franklin Avenue from Orchid Avenue to Highland Avenue;

12. Highland Avenue from Franklin Avenue to Yucca Street;

13. All of the territory within 100 feet of Hollywood Boulevard between Hillhurst Avenue and La Brea Avenue;

14. All of the territory within 100 feet of Sunset Boulevard between Hillhurst Avenue and the city boundary line 190 feet west of Havenhurst Drive.

III. Wilshire. All of the territory bounded by the following streets:

1. Sixth Street from Western Avenue to Commonwealth Avenue;

2. Commonwealth Avenue from Sixth Street to Wilshire Boulevard;

3. Wilshire Boulevard from Commonwealth Avenue to Catalina Street;

4. Catalina Street from Wilshire Boulevard to Eighth Street;

5. Eighth Street from Catalina Street to Mariposa Avenue;
6. Mariposa Avenue from Eighth Street to Seventh Street;
7. Seventh Street from Mariposa Avenue to Ardmore Avenue;
8. Ardmore Avenue from Seventh Street to Wilshire Boulevard;
9. Wilshire Boulevard from Ardmore Avenue to Western Avenue;
10. Western Avenue from Wilshire Boulevard to Sixth Street; and
11. All of the territory within 100 feet of Wilshire Boulevard between the eastern city boundaries of the city of Beverly Hills and the Harbor Freeway.

IV. Beverly-Fairfax. All of the territory bounded by the following streets:

1. Beverly Boulevard from Fairfax Avenue to a point 120 feet west of Gardner Avenue;
2. A line 120 feet west of and parallel to Gardner Avenue from Beverly Boulevard to Third Street;
3. Third Street from a point 120 feet west of Gardner Avenue to Fairfax Avenue; and
4. Fairfax Avenue from Third Street to Beverly Boulevard.

V. Crenshaw. All of the territory bounded by the following streets:

1. Crenshaw Boulevard from Thirty-ninth Street to Stocker Street;
2. Stocker Street from Crenshaw Boulevard to Rosalia Drive;
3. Rosalia Drive from Stocker Street to Marlton Avenue;
4. Marlton Avenue from Rosalia Drive to Thirty-ninth Street; and
5. Thirty-ninth Street from Marlton Avenue to Crenshaw Boulevard.

VI. Century City. ➤ All of the territory bounded by the following streets:

1. Santa Monica Boulevard between Century Park West and the westerly city boundary of the City of Beverly Hills;
2. The westerly city boundary of the City of Beverly Hills from Santa Monica Boulevard to Olympic Boulevard;
3. Olympic Boulevard from the westerly city boundary of the City of Beverly Hills to Century Park West; and
4. Century Park West from Olympic Boulevard to Santa Monica Boulevard.

Excepting that portion of the above-described territory described as follows:

Beginning at the point of intersection of the center line of Olympic Boulevard and Century Park West, thence northwesterly along center line of Century Park West 791 feet, thence N50° 29' 00" E822.21 feet, thence S39° 29' 13" E9.63 feet, thence S84° 29' 13" E29.59 feet, thence N50° 30' 47" E19.00 feet, thence S39° 29' 13" E295.17 feet, thence S35° 38' 00" E to the center line of Olympic Boulevard thence southwesterly along said center line to the point of beginning. ◀

VII. Westwood. All of the territory bounded by the following streets:

1. Le Conte Avenue from Levering Avenue to Tiverton Avenue;
2. Tiverton Avenue from Le Conte Avenue to the intersection of Lindbrook Drive and Glendon Avenue;

3. Glendon Avenue from the intersection of Lindbrook Drive and Tiverton Avenue to Wilshire Boulevard;
4. Wilshire Boulevard from Glendon Avenue to Gayley Avenue;
5. Gayley Avenue from Wilshire Boulevard to the alley 200 feet north of Wilshire Boulevard;
6. The alley directly west of Gayley Avenue from a point 200 feet north of Wilshire Boulevard to Weyburn Avenue;
7. Weyburn Avenue from the alley west of Gayley Avenue to Gayley Avenue;
8. Gayley Avenue from Weyburn Avenue to Levering Avenue;
9. Levering Avenue from Gayley Avenue to Le Conte Avenue; and
10. All of the territory within 100 feet of Wilshire Boulevard between Veteran Avenue and the westerly city limits of the City of Beverly Hills; and
11. All of the territory within 100 feet of Wilshire Boulevard between Centinela Avenue and Federal Avenue.

VIII. Van Nuys. All of the territory bounded by the following streets:

1. Vesper Avenue from Calvert Street to Victory Boulevard;
2. Victory Boulevard from Vesper Avenue to Sylmar Avenue;
3. Sylmar Avenue from Victory Boulevard to Calvert Street;
4. Calvert Street from Sylmar Avenue to Vesper Avenue; and
5. All of the territory within 100 feet of Van Nuys Boulevard between Victory Boulevard and Sherman Way.

IX. Venice. All of the territory bounded by the following streets:

1. Horizon Avenue from Ocean Front Walk to Pacific Avenue;
2. Pacific Avenue from Horizon Avenue to Eighteenth Avenue;
3. Eighteenth Avenue from Pacific Avenue to Ocean Front Walk; and
4. Ocean Front Walk from Eighteenth Avenue to Horizon Avenue.

X. San Pedro. All of the territory bounded by the following streets:

1. Fourth Street from Pacific Avenue to Harbor Boulevard;
2. Harbor Boulevard from Fourth Street to Seventh Street;
3. Seventh Street from Harbor Boulevard to Beacon Street;
4. Beacon Street from Seventh Street to Eighth Street;
5. Eighth Street from Beacon Street to Pacific Avenue; and
6. Pacific Avenue from Eighth Street to Fourth Street.

Excepting that portion of the above-described territory described as follows:

Beginning at the point of intersection of the easterly line of Mesa Street and the southerly line of Fourth Street; thence southerly along said easterly line of Mesa Street to the northerly line of the alley running parallel to said Fourth Street and distant 155 feet southerly of the center line of said Fourth Street; thence along the northerly line of said alley to a point 498 feet from the easterly line of said Mesa Street; thence south 10 feet

and thence easterly to the westerly line of Centre Street; thence northerly along said westerly line to the southerly line of said Fourth Street; thence westerly along said southerly line to the point of beginning.

(b) **Fire District No. 2.** Fire District No. 2 shall be all the territories ➤ on the Zoning Map, which is made a part of Chapter 1, Article 2 of this Code, as being in the PB, ◀ C, or M Zones except those territories designated as C1 or C1.5 Zones or territories located in Fire District No. 1.

(c) **Mountain Fire District.** The Mountain Fire District shall be all of the territory so designated by the boundaries shown on the Mountain Fire Districts Map as established in Sec. 57.25.01 of the Los Angeles Municipal Code.

(d) **Fire Buffer Zone.** The Fire Buffer Zone shall be all of the territory so designated by the boundaries shown on the Mountain Fire Districts Map as established in Section 57.25.01 of the Los Angeles Municipal Code.

(e) **Buildings Overlapping Fire District Boundaries.** Every building or structure having any part thereof within a fire district shall be deemed to be entirely in that fire district.

A building or structure located partly within two or more fire districts shall comply throughout to the more restrictive provisions of each fire district.

SEC. 91.1602 — ADDITIONS TO BUILDINGS

An addition may be made to any building in a Fire District if the added portion conforms to this Division and also, if the entire building, including the addition, is within the limit of area specified in Section 91.0506 for building of like type and occupancy.

***EXCEPTION:** An addition to a provisional structure shall not be permitted.*

SEC. 91.1603 — GENERAL REQUIREMENTS

(a) **Conforming Buildings.** Alterations and repairs to a conforming building in a Fire District shall conform to the requirements of this Code.

(b) **Nonconforming Buildings.** Alterations and repairs to a nonconforming building in a Fire District may be of the same type of construction as the existing building if the aggregate value of such repairs, in any one year, does not exceed 10% of the replacement cost of the building.

Alterations or repairs in excess of 10% of the replacement cost of the building or structure may be made provided all of the repairs and the new construction conform to the materials and type of construction required for a new building of like area, height and occupancy in the same location.

Whenever a nonconforming building or structure has been damaged, or is in need of repairs or alterations required by the Los Angeles Municipal Code in an amount exceeding 50% of the replacement cost, the entire building or structure shall be made to conform to the Code or shall be demolished.

(c) **Plaster.** Fire-resistive plaster may be applied to the exterior of any building if there is compliance with the other provisions of this Code.

(d) **Moving Buildings.** Any building moved to a new location in any Fire District shall be made to comply with the requirements of that Fire District.

(e) **Construction Sheds and Canopies.** Construction sheds and

protection canopies may be erected in a Fire District if there is compliance with the other provisions of this Code.

(f) **Projections from Buildings.** Projections from buildings conforming to the regulations of Division 45 may be constructed in any Fire District.

(g) **Sprinklers.** 1. In every building in Fire District No. 1 and Fire District No. 2, every story, with a floor surface elevation more than four feet lower than the highest elevation of the floor landing or tread of any required exit from that story, shall be sprinklered.

EXCEPTION: Sprinklers need not be installed in locations expressly excepted in the Los Angeles Plumbing Code provided other approved fire protection equipment is installed.

2. In an existing building in Fire Districts Nos. 1 and 2, every story which has a floor surface elevation more than four feet lower than the highest elevation of the floor landing or tread of any required exit from the story, and is used for keeping, storing, manufacturing, repairing or processing any combustible material, shall be sprinklered.

EXCEPTION: This Subdivision shall not apply to any building which is only occupied as a single-family dwelling.

(h) **Roof Covering.** 1. The roof covering of every building or structure in a Fire District or Fire Buffer Zone shall be a fire-retardant roof covering conforming to the requirements of Division 32 of this Code.

EXCEPTIONS: 1. Buildings or structures in either Fire District No. 1 or No. 2 shall not use a Class "C" fire retardant roof covering which is not expressly permitted therefor by other provisions of said Division 32.

2. The Superintendent of Building shall have the authority to establish rules for the approval and use of other roof coverings in Mountain Fire Districts and Fire Buffer zones.

2. Notwithstanding any other provisions of this Code, reroofing shall comply with the requirements of this Subsection.

3. The Department may grant waivers or modifications of the requirements of this Subsection with respect to minor repairs or additions to buildings or structures existing within the Mountain Fire District before January 6, 1963, or within the Fire Buffer Zone before the effective date of the ordinance establishing the Fire Buffer Zone if the Department finds that such waivers or modifications are not detrimental to the public safety and are in keeping with the spirit and intent of the applicable provisions of this Code.

(i) **Miscellaneous Structures.** In Fire Districts Nos. 1 and 2, isolated structures constructed of incombustible materials may be unprotected if used for other than human occupancy.

Loading platforms, having no roof and not over 48 inches above the ground, may be of wood. Loading platforms shall be enclosed and shall be firestopped into areas not exceeding 2,500 square feet.

SEC. 91.1604 — SPECIAL REQUIREMENTS FOR FIRE DISTRICT NO. 1

(a) **Types of Buildings Permitted.** Every building in Fire District No. 1 shall be one of the following types: Type No. I; Type

No. II; Type No. III; Type No. III-A; Type No. III-B; Type No. IV; and provisional structures as provided in Section 91.1605.

(b) **Type IV Buildings.** Every building of Type IV construction in Fire District No. 1, except provisional structures allowed by this Section, shall have at least two-hour fire-resistive construction for exterior walls within 10 feet of and facing a property line, and shall have at least one-hour fire-resistive construction for exterior walls facing a property line and less than 30 feet distance therefrom.

EXCEPTION: Such walls may be one-hour less fire-resistive than specified herein if the building is not more than one story in height nor more than 2,500 square feet in area.

(c) **Openings in Exterior Walls.** In the following cases all openings in the exterior walls of buildings in Fire District No. 1, other than provisional structures, shall be protected by a fire assembly having a three-fourths hour fire-resistive rating:

1. When within 10 feet of a property line;
2. When within 20 feet of an unprotected opening in another building;
3. When within 20 feet of a building which has less than one-hour fire-resistive exterior walls;
4. When within 20 feet of the opposite side of a public way.

SEC. 91.1605 — PROVISIONAL STRUCTURES IN FIRE DISTRICTS NOS. 1 AND 2

(a) **Definitions.** For the purposes of this Section, "Provisional Structure" shall mean any structure complying with the provisions of this Section.

(b) **Size Limit.** A Type V provisional structure shall not exceed 12 feet in its longest dimension, 12 feet in height, or 100 square feet in overall area, including any roof projection.

A Type IV provisional structure shall not exceed 400 square feet in building area and shall not exceed 12 feet in height.

(c) **Exterior Walls.** The requirements of Section 91.0504 shall not apply to provisional structures.

The exterior walls of a Type IV provisional structure shall not be required to have a fire-resistive time period of construction.

The exterior walls of a Type V provisional structure shall be of one-hour fire-resistive construction.

EXCEPTION: The exterior walls of a Type V provisional structure which is located on an automobile parking station lot are not required to have a time period of fire resistance if the structure does not exceed 12 feet in its longest dimension, and 50 square feet in overall area, including any roof projection; and provided further, that such structure shall be used in conjunction with the business of operating an automobile parking lot, and shall maintain a setback from every street front, not less than ½ the lot depth.

(d) **Location.** A provisional structure shall be located not less than 40 feet from any building of Type IV or Type V construction.

(e) and (f) Repealed.

(g) **Parking Lot Structures.** In lieu of a permanent foundation a provisional structure used as an automobile parking lot office may be anchored to an asphalt slab by four or more ½-inch by 12-inch metal pins or equivalent anchorage. Toilet facilities will not be required.

SEC. 91.1606 — SPECIAL REQUIREMENTS FOR FIRE DISTRICT NO. 2

(a) **Types of Buildings Permitted.** Buildings in Fire District No. 2 may be of any type of construction permitted by this Code with the further restriction that Type V buildings shall also comply with this Section.

(b) **Type V Buildings.** One- or two-story Type V buildings in Fire District No. 2 shall have exterior walls of one-hour fire-resistive construction. Three-story Type V buildings shall be limited to Groups G, H, or R Occupancies and shall be of one-hour fire-resistive construction throughout.

EXCEPTIONS: *The one-hour fire-resistive construction required by this Subsection for exterior walls of one- or two-story buildings is not required where:*

1. *The wall faces an open yard on the lot or public way or any combination thereof equal to a total width of 60 feet.*
2. *The building is sprinklered throughout.*
3. *The walls of greenhouses and lath houses use standard ¾-inch thick wood-lath which is evenly spaced so that a minimum of 40 per cent of the wall is open.*
4. *The structure is a cooling tower or a water tank.*

The exceptions in this Subsection shall not modify any other provision of this Code that requires fire-resistive construction because of occupancy or location on the lot.

(c) Repealed.

SEC. 91.1607 — SPECIAL REQUIREMENTS FOR MOUNTAIN FIRE DISTRICTS

(a) **Unenclosed Underfloor Areas.** Residential buildings shall have all underfloor areas completely enclosed to the ground with construction as required for exterior walls.

EXCEPTIONS: *1. Complete enclosure shall not be required where the underside of all exposed floors and all exposed structural columns, beams and supporting walls are protected as required for exterior one-hour fire-resistive construction.*

2. The area under cantilevered balconies and unroofed walking decks need not be considered as underfloor area provided exposed utilities, pipes, or other mechanical devices are not located in the area.

(b) **Utilities.** All utilities, pipes, furnaces, water heaters or other mechanical devices located in an exposed underfloor area of a residential building shall be enclosed with material as required for exterior one-hour fire-resistive construction. Adequate covered access openings for servicing such utilities shall be provided as required by appropriate codes.

(c) **Attic Openings.** All exterior attic openings shall be protected with a minimum ¾-inch mesh corrosion resistant screen.

SEC. 91.1608 — PROHIBITED VEHICLES.

No vehicle in Fire District Nos. 1 or 2 shall be used for any occupancy except as permitted for a mobilehome, travel trailer or camp car in a park designed for such use, or for industrial catering trucks as defined in Section 91.0403 of this Code.

DIVISION 17 — TYPES OF CONSTRUCTION

SEC. 91.1701 — GENERAL

(a) **Scope.** Every building or structure hereafter erected shall conform to one of the Types of Construction specified in this Division. Types of buildings are classified according to the degree of fire resistance; Type I shall be considered the most fire-resistant and Type V the least fire-resistant.

Every building shall be required to conform to a Type of Construction which meets the minimum requirements based on occupancy and location in Fire Districts.

(b) **Alterations.** A building permit for alterations which would result in changing a building to a less fire-resistant type of construction may be issued provided the owner of the building files with the Department an affidavit stating that it is his desire to so change the Type of Construction.

(c) **Mixed Types.** An addition of any type of construction may be made to an existing building provided the following requirements are complied with:

1. The existing building complies with all construction and fire district requirements of this Article for a new building of identical type construction located on the lot;

2. The new addition complies with all construction and fire district requirements of this Article for a new building of its identical type construction located on the lot, except for division wall separation;

3. The entire combined building shall conform to the height, area, and occupancy requirements for the least fire-resistive type of construction that will exist in any portion of the building.

(d) **Unclassified Buildings.** Any building not conforming to the construction requirements of Type I, II, III, III-A, III-B, or IV Construction shall be classed as a Type V building.

SEC. 91.1702 — HEIGHT OF BUILDING

(a) **Height.** The height of a building, as limited by Table 17-A, shall be the vertical distance between the highest point of the adjacent ground elevation and the ceiling of the top story of the building, provided that the height measured from the lowest point of the adjacent ground elevation shall not exceed the maximum height allowed by more than 15 feet. No roof shall exceed the height limit by more than 14 feet except as allowed for roof structures.

(b) **Roof Construction.** Penthouses or roof structures for the housing of elevators, stairways, tanks, ventilating fans, or similar equipment required to operate and maintain the building, and/or parapet walls, skylights, towers, roof signs, flag poles, chimneys, smokestacks, aerial masts, or similar structures may be erected above the limits of height prescribed in Section 91.1705, but no penthouse or roof structure, or any space above the ceiling of said top story shall be allowed for the purpose of providing additional floor space above the top floor of the building.

Penthouses and roof structures shall conform to the regulations of Division 36 (Penthouses and Roof Structures).

(c) **Stories.** The number of stories used in determining the height and type of construction of a building shall include only the first story and all stories thereabove.

(d) **Area Limitation.** The total floor area contained in all the

buildings on any one building site shall not exceed that permitted by Article 2 of Chapter 1 of the Los Angeles Municipal Code.

SEC. 91.1703 — GENERAL CONSTRUCTION REQUIREMENTS

(a) **General.** Except where expressly exempted by this Code every building shall be constructed in accordance with the requirements exhibited in Table No. 17-A.

(b) **Structural Frame.** The structural frame shall be considered to be the columns and the girders, beams, trusses and spandrels having direct connections to the columns and all other members which are essential to the stability of the building as a whole. The members of floor or roof panels which have no connection to the columns shall be considered secondary members and not part of the structural frame.

SEC. 91.1704 — EXTERIOR WALL OPENINGS

(a) **Types I, II, III, and III-A Buildings.** The aggregate area of openings in any exterior wall of a Type I, II, III, or III-A building shall not exceed 25 per cent of the area of the wall at three feet nor 75 per cent of the area of the wall at 30 feet from a property line or the building line on the opposite side of a public way. The percentage of openings in walls may be determined by straight line interpolation between three and 30 feet.

(b) **Type III-B Buildings.** The aggregate area of openings in any exterior wall of a Type III-B Building shall not exceed 25 per cent of the area of the wall at three feet nor 75 per cent of the area of the wall at 15 feet from a property line or the building line on the opposite side of a public way. The percentage of openings in walls may be determined by straight line interpolation between three and 15 feet.

(c) **Types IV and V Buildings.** The aggregate area of openings in any exterior wall of a Type IV or V Building, if required to be of fire-resistive construction, shall not exceed 25 per cent of the area of the wall at three feet nor 75 per cent of the area of the wall at 10 feet from a property line. The percentage of openings in walls may be determined by straight line interpolation between three and 10 feet.

(d) **All Types.** In no case shall the aggregate area of openings in any exterior wall required to be of fire-resistive construction exceed 75% of the gross area of the wall.

EXCEPTION: Exterior walls of covered walkways complying with the requirements of Section 91.0513 may have unlimited openings.

(e) **Automatic Sprinkler Systems.** An automatic sprinkler system shall be installed in any story having a floor area exceeding 1,500 square feet.

EXCEPTIONS: 1. An automatic sprinkler system need not be provided in any story having clear and unobstructed openings at least 20 square feet in area and entirely above grade in each 50 linear feet or fraction thereof of exterior wall in the story on at least one accessible exterior wall of the building. Openings shall have a minimum dimension of 30 inches.

If the exterior wall opposite the wall provided with openings is more than 75 feet from that wall, openings as specified herein shall be provided in at least two accessible exterior walls of that story or it shall be sprinklered.

This exception shall not apply to any story where the floor

elevation is more than four feet lower than the highest elevation of the floor, landing, or tread of any required exit from that story.

2. Sprinklers need not be installed in locations expressly excepted in the Los Angeles Plumbing Code, provided other approved fire protection equipment is installed.

SEC. 91.1705 — SPECIAL CONSTRUCTION REQUIREMENTS

(a) Parapets. Every exterior wall and division wall shall extend to at least the same height as any part of the roof, through which the wall will pass, within a horizontal distance of 15 feet and in no case shall it extend less than 3 feet above the point where the wall and roof intersect.

EXCEPTIONS: 1. Exterior walls or division walls of one- and two-hour fire resistive time period rating, may extend to not less than 2 feet above the roof.

2. Parapets will not be required on any of the following:

a. Any wall not required to be of fire-resistive construction.

b. Any building having a roof of two-hour fire-resistive construction.

c. Exterior walls facing a street having a width of 30 feet or more.

d. Exterior walls facing and 30 feet or more from a property line.

e. Any wall from which a roof rises from 3:12 or greater and extends inward a horizontal distance not less than 10 feet.

f. Any exterior wall of a Type V building provided the roof within 10 feet of a property line and the eaves have a fire-resistive time period equivalent to that required for the exterior wall.

(b) Shaft Enclosures. 1. Every opening in a floor shall be enclosed with walls, floor and ceiling of fire-resistive construction of the time period exhibited in Table No. 17-A. A fire sprinkler system conforming to the requirements of the Plumbing Code shall be installed in all rubbish and linen chutes.

EXCEPTIONS: 1. In other than Group D Occupancies, enclosures will not be required for openings between two adjacent stories when such openings are not connected with openings to other stories. This exception shall not apply to a basement.

2. In sprinklered buildings of Type I construction housing Group G Occupancies, escalators need not be enclosed, provided all stairways are enclosed and sprinkler heads in escalator soffits and around the perimeter of the opening shall be spaced not more than six feet apart and not more than 24 inches from face of opening. A continuous incombustible draft stop shall be installed on the ceiling side of the opening, extending a minimum of 12 inches below the ceiling and located between the opening and the sprinkler heads.

3. In Group G Occupancies basement stairs may be unenclosed in the first story if completely enclosed in the basement, provided these stairs are not continuous with stairs to upper floors.

4. Subgroup F-1P Occupancies shall not require a shaft enclosure between the first story and any upper story or roof, except for the enclosure of required exits.

TABLE NO. 17-A — CONSTRUCTION REQUIREMENTS

ITEM		TYPE OF BUILDING						
		Type I	Type II	Type III	Type III-A	Type III-B	Type IV	Type V
Maximum Height Feet (c)		Unlimited (a)	75	60	50	50	60 (d)	50
Maximum No. of Stories		Unlimited (a)	6	5	3	3	3 (e)	3 (f)
Materials of Construction	Exterior and Inner Court Walls	Incombustible Materials	Incombustible Materials	Incombustible Materials	Incombustible Materials	Incombustible Materials	Incombustible Materials	Any Materials
	Structural Frame	Incombustible Materials	Incombustible Materials	Any Materials (g), (i)	Any Materials (i)	Any Materials (i)	Incombustible Materials	Any Materials (g), (i)
	Floors, Roof and Partitions	Incombustible Materials (i)	Incombustible Materials (i)	Any Materials	Any Materials	Any Materials	Incombustible Materials	Any Materials
	Shaft Enclosures	Incombustible Materials	Incombustible Materials	Any Materials	Any Materials	Any Materials	Incombustible Materials	Any Materials
	Stairs	Incombustible Materials	Incombustible Materials	Any Materials (b)	Any Materials	Any Materials	Incombustible Materials	Any Materials
	Exterior Walls	4-hour (k)	2-hour	4-hour	4-hour	2-hour	None	None
Fire-Resistive Time Period	Inner Court Walls	3-hour (k)	2-hour	1-hour	1-hour	None	None	None
	Structural Frame	3-hour	2-hour	1-hour	None	None	None	None
	Partitions	1-hour (h)(k)	1-hour (h)	1-hour (h)	None	None	None	None
	Floors and Roofs	2-hour (k)	2-hour	1-hour	None	None	None	None
	Shaft Enclosure	2-hour	2-hour	1-hour	1-hour	1-hour	1-hour	1-hour

FOOTNOTES:

- (a) See Subsection 91.1702 (d) for area limitation.
- (b) In every building more than three stories in height, stairways shall be constructed of incombustible materials.
- (c) Heights may be further limited in certain zones by the Comprehensive Zoning Ordinance.
- (d) Towers, used exclusively for industrial processes, may extend to not more than 40 feet above such height limit.
- (e) For Subgroup F-1P Occupancies See Division 11.
- (f) Type V buildings are not permitted in Fire District No. 1 and special construction requirements apply in Fire District No. 2. See Sections 91.1604 and 91.1606.
- (g) "Any Materials" as used in Table No. 17-A for Type III, III-A, III-B, and V shall mean any material specifically regulated by this Code.
- (h) Thirty-minute fire-resistive partitions permitted in Subgroup G-1 Occupancies. See Section 91.4305(a).
- (i) Where exterior bearing walls are of incombustible materials, interior supports of wood construction using platform type framing shall support no more than two floors and a roof.
- (j) Approved fire retardant treated wood may be used for studs, plates and blocking in 1-hour fire resistive non-bearing partitions, provided the fire resistive requirements are maintained.
- (k) For incombustible construction fire ratings for other than floors may be one hour less than the indicated values in buildings that are sprinklered throughout.

2. Every opening into a shaft enclosure shall be provided with a fire assembly having a fire protection rating of one hour for openings through one-hour walls and one and one-half hours for openings through two-hour walls. The fire assemblies for stairway shafts shall be equipped with self-closing devices.

EXCEPTIONS: 1. If not required by Division 16 of this Code (Fire District Regulations), fire protection may be omitted from shaft-enclosure openings facing:

A. A public way or inner court at least 20 feet wide;

B. An outer court at least 10 feet wide.

2. A self-closing door not less than 1½ inches thick of solid wood may be used for basement stair enclosures, provided the basement stairs are not continuous with stairs to upper floors and the floor over the basement has no fire-resistive requirements.

3. Air exhaust ducts, penetrating a ventilation exhaust riser shaft enclosure serving toilet rooms, bathrooms or rooms used for residential purposes, may use sub-ducts extending up the shaft a distance of 22 inches above the crown of the duct in lieu of a fire assembly.

4. A ventilation duct serving a grease hood need not be equipped with a fire protection assembly, provided it complies with the requirements of Section 95.5160 of the Los Angeles Municipal Code (Heating, Ventilating, Air Conditioning and Refrigeration Code).

5. Skylights over stairways and shafts need not be equipped with a fire protection assembly, provided the installation conforms to the requirements of Section 91.3603.

(c) **Inner Court Enclosures.** Every inner court two or more stories high, whose width is less than 20 feet, shall have both floor and walls of the fire-resistive construction set forth in Table No. 17-A but shall not have a fire-resistive time period less than as required for a shaft enclosure. Wall openings shall be protected by a fire assembly having a three-fourths hour fire-resistive rating.

(d) Any building in which there is a mall shall be fully sprinklered and of Type I construction.

EXCEPTION: If fully sprinklered and not exceeding 36,000 square feet in area and conforming to the other limitations for area given in Table No. 5-B, such buildings may be of other than Type I construction.

Plastics used in any installation within the mall or in exit ways shall be limited to the following:

1. Approved plastic diffusers that are an integral part of a lighting fixture listed by an approved laboratory. Such plastic diffusers shall occupy not more than 15 square feet of any 100 square feet of ceiling area.

2. Approved plastics in signs conforming to the following limitations:

(A) **Size and Location.** Within each story and from side-wall to side-wall of the tenancy, signs shall be limited as follows: The sign shall not exceed 20% of the wall area facing the mall; shall not exceed a height of 36 inches; and shall be located a minimum distance of 18 inches from adjacent tenancies.

(B) **Construction.** All edges and the back of the sign shall be encased in metal.

The ballast for the sign shall be fully encased in metal.

(e) **Roofs.** Attic and roof spaces shall be constructed as specified in Division 32 of this Code (Roof Construction).

(f) **Fire Protection of Structural Members.** In any type of building all structural members furnishing the vertical support for masonry or concrete which is located in an upper story shall have at least one-hour fire protection, except lintels as specified in Section 91.1706 (e).

All structural members furnishing vertical support for fire-resistive construction shall have fire-resistive protection with the same required time period rating as the construction supported.

EXCEPTION: These provisions shall not be applicable to a Subgroup F-1P Occupancy of Type IV construction.

(g) **Partitions.** Permanent partitions, supported on required two-hour fire-resistive floor construction shall extend through any combustible flooring to the supporting floor slab.

(h) **Flammable Materials.** ➤ No canvas, cloth, cardboard, paper or other similar flammable material shall be used in the construction of any partition or ceiling either temporary or permanent. Plywood shall have a minimum thickness of $\frac{1}{4}$ -inch and all other panel board shall have a minimum thickness of $\frac{3}{8}$ -inch if flammable. Plastic material shall be an approved variety as provided in Division 61.

EXCEPTIONS:

1. Paper or plastic backed metal or wire lath may be used in walls or partitions provided such lath is confined in the cavities of the walls or partitions.

2. Flammable materials may be used in the construction of temporary display and exhibit structures provided such materials are flame-proofed as required by Article 7, Chapter 5 of the Los Angeles Municipal Code.◀

SEC. 91.1706 — EXCEPTIONS TO TABLE NO. 17-A

(a) **Exterior Walls.** Exterior walls may be constructed as set forth in this Subsection except where the occupancy requirements of this Code are more restrictive. Exterior and inner court walls shall be of not less than one-hour fire-resistive construction for those occupancies required to be of one-hour fire-resistive construction by the special occupancy divisions of this article.

1. **Street fronts.** In buildings of Type I, II, III, III-A, or III-B construction, exterior walls facing a public way 30 feet or more in width may be of incombustible materials without the fire-resistive time period specified in Table No. 17-A. Bulkheads, not more than 42 inches high, below show windows need not be of incombustible or fire-resistive material.

2. **Nonbearing walls.** Type I and Type II buildings may have nonbearing exterior and nonbearing inner court walls of the following fire-resistive time period of construction:

A. Walls facing a yard or court of less than 10 feet in width and walls facing and within 10 feet of a property line may be of two-hour fire-resistive incombustible construction.

B. Walls facing a yard, court, or public way of 10 feet or more but less than 30 feet in width may be of one-hour fire-resistive incombustible construction.

C. Walls facing a yard, court, or public way of 30 feet or more in width may be of incombustible construction without a fire-resistive time period.

(b) **Non-Rated Partitions.** Non-rated partitions without a fire-resistive time period rating may be constructed in any building if such partitions do not establish a public corridor or an occupancy separation. Non-rated partitions located within any room

classified as an A, B, D, or S Occupancy or located in a Type IV building shall be of all incombustible construction.

(c) **Fire Protection of Roof Trusses.** In any building housing a Group A, B, or S Occupancy, fire protection of steel roof trusses may be omitted where no member is less than 25 feet above any floor or balcony, provided all supporting columns are fire-protected as required in Table No. 17-A.

(d) **Roofs.** Roofs more than 25 feet above any floor or balcony in any Group A, B, or S Occupancy need not have any fire-resistive time-period rating. In Type I and Type II Buildings the roof shall be of incombustible materials.

(e) **Lintels.** Fire protection may be omitted from the lower flange of any structural steel lintel having points of supports not more than six feet apart.

(f) **Unprotected Materials Permitted.** Unprotected combustible and incombustible materials are permitted for the following uses:

1. Except as required by Section 91.1711, doors, sash, and frames where openings are not required to be fire protected.

2. The covering of ceilings or walls conforming to Division 42 and trim and floor covering, where the required fire-resistive time-period rating is provided, exclusive of the attached trim, floor or covering. This Subdivision does not apply to Type IV buildings.

3. Guard rails, showcases, shelves, and similar fixtures when not used as partitions.

4. Mezzanine floors except in Groups A, B, S and D Occupancies.

5. Floors, platforms, and ceilings for store fronts and show window enclosures facing a public way.

6. A luminous ceiling of approved plastics in continuous or separate panels may be used in other than Groups A, B, D, E, F and S Occupancies or in required exitways and malls, provided it complies with this Subdivision. For the purpose of this Subdivision, a luminous ceiling shall be defined as any light diffusing or light transmitting ceiling consisting of transparent, translucent, eggcrated, meshed, louvered, or similar materials suspended from a ceiling or structural framework by means of hangers and which may include a supporting grid on which the material rests.

The following general provisions shall apply to all luminous ceilings:

A. The floor and ceiling assembly above the panels shall provide the required fire-resistive time-period rating, exclusive of the plastic panels.

B. No combustible material shall be located between the panels and the ceiling and any electrical equipment located in this area shall be fully enclosed in metal.

C. All panels shall be freely mounted or attached in a manner satisfactory to the Department.

D. Where sprinklers are installed, they shall be located above as well as below the luminous ceiling panels unless the panels are tested by an approved testing agency with an approved reinspection service, and the panels are listed as satisfactory for installation below sprinklers.

E. The Class and Smoke Density of the plastic panels shall meet the rating limitations specified in Table No. 42-B for the occupancy and location of use.

Luminous ceiling of plastic panels meeting the requirements for Class I material with a Smoke Density regulated by Table No. 42-B for the occupancy and use intended, or which are protected on both sides by an approved automatic sprinkler system, shall not be limited in area.

Luminous ceiling of plastic panels other than Class I material or other than panels protected by an approved sprinkler system shall be limited to $\frac{1}{2}$ of the area of the room in which located with the further provisions that such panels, as installed, shall fall from their mountings at an ambient temperature of at least 200°F below the ignition temperature of the plastic material, as measured by ASTM D-1929 "Standard Method of Test for Ignition Properties of Plastics" and that the panels shall be mounted in the ceiling in such a manner that they will remain in place at an ambient room temperature of 175°F for a period of not less than 15 minutes.

EXCEPTION: The $\frac{1}{2}$ area limitation shall not apply, provided the panels have an Average Extent of Burning, as defined in ASTM D-635-72, of not more than 1 inch.

(g) Subsection repealed.

(h) **Height of One-Story Type IV Buildings.** One-story buildings of Type IV construction used for industrial purposes may have a height of 100 feet if surrounded by public space, streets, or yards not less than 20 feet in width.

(i) **Type IV Buildings.** Wood nailers not less than two inches in any dimension, which are continuously in contact with eavestruts or purlins, may be bolted to eavestruts or purlins in Type IV buildings to fasten roof sheets by nailing.

Combustible partitions of not less than one-hour fire-resistive construction may be used to separate offices and accessory areas from the remainder of a Type IV Building, provided the area separated does not exceed 25% of the overall area of the building. Ceilings installed over areas separated by such partitions shall be of incombustible or one-hour fire-resistive construction.

EXCEPTION: This Subsection shall not apply to buildings housing Subgroup F-1P Occupancies.

(j) **Combustible Partitions Permitted.** In Type I Buildings of G-1 Occupancy that have a complete sprinkler system complying with the provisions of the Los Angeles Municipal Code, combustible cases and partitions around dressing rooms will be allowed, except for partitions adjacent to and a part of a shaft enclosure or exit corridor. These passageways and dressing rooms shall be without ceilings which interfere with the proper functioning of the sprinkler system. Where partitions or cases interfere with the proper functioning of the sprinkler system, this system shall be adjusted to properly serve the area.

SEC. 91.1707 — MEZZANINE FLOORS

(a) **Maximum Area.** The aggregate area of all mezzanine floors shall not exceed $\frac{1}{3}$ of the floor area of the rooms in which they are located.

(b) **Mezzanine Floors in Types I, II and IV Buildings.** Mezzanine floors in Type I, Type II, and Type IV buildings shall be constructed of incombustible materials.

(c) **Enclosed Areas Under Mezzanine Floors.** Where the Type of Construction requires one-hour fire-resistive partitions, every enclosed area under a mezzanine floor shall have a ceiling of fire-resistive plaster.

SEC. 91.1708 — TYPE V BUILDINGS — SPECIAL PROVISIONS

(a) **Construction.** Wood-frame dwellings, one- and two-story apartment houses and hotels of conventional exterior bearing wall construction and accessory buildings may be designed and constructed as provided in Division 48 of this Code (Wood-Frame Dwellings).

(b) **Footings.** All wood-frame exterior walls and bearing partitions shall be supported by continuous footing walls with the minimum dimensions exhibited in Table No. 17-B or the footings shall be designed in accordance with the provisions of Division 28 of this Code (Excavations, Foundations, and Retaining Walls).

Mudsills shall be bolted to the footing wall with bolts, not less than $\frac{1}{2}$ inch in diameter, embedded at least seven inches into the footing wall. A bolt shall be provided within 12 inches of the end of each mudsill member and additional bolts, spaced not farther apart than six feet, shall be provided elsewhere.

Footings shall be level top and bottom and, where founded under sloping ground, shall be stepped to provide such level bearing surfaces. The steps in the footing wall shall overlap the steps in the excavation by a distance not less than the depth of the step in the excavation. Steps in the excavation shall have a maximum rise of 18 inches and a minimum run of 36 inches.

**TABLE NO. 17-B — MINIMUM DIMENSIONS FOR
CONTINUOUS FOOTING WALLS**

Number of Stories	FOOTING			FOOTING WALL	
	Depth Below Undisturbed Ground Surface	Width	Thickness	Thickness	Height Above Ground Surface
1	12"	12"	6"	6"	6"
2	18"	18"	8"	8"	8"
3	24"	21"	10"	10"	6"
Piers not under partitions	6"	12"x12"	12"	---	6"
Piers under nonbearing partitions	6"	16"x16"	12"	---	6"

Note: The ground under the floor may be excavated to the elevation of the top of the footing.

(c) **Slab Footings.** If not more than 1,000 square feet in area any one-story building not used for residential purposes having wood or steel stud bearing walls may rest upon a concrete slab. Such slab shall be three inches or more in thickness if supported by undisturbed natural soil. If resting upon filled ground, such slab shall be at least four inches thick and shall also be reinforced with six-inch by six-inch No. 10 by No. 10 welded wire fabric one inch below the top surface of the slab, or equivalent reinforcement. Exterior walls resting upon an unreinforced slab shall be supported by a footing eight inches wide extending eight inches into natural ground.

(d) **Accessory Buildings.** One-story wood-frame buildings not to be used for human occupancy may rest on a mudsill placed on the ground surface if the building has no wood floor and is not more than 20 feet in width.

(e) **Repealed.**

(f) **Fire Resistive Construction.** Every Type V building three

stories in height shall be of not less than one-hour fire-resistive construction.

EXCEPTIONS: *The requirements of this Subsection shall not apply to:*

1. *Group R Occupancies.*
2. *Completely sprinklered buildings.*

SEC. 91.1709 — TENTS AND CLOTH-COVERED STRUCTURES

(a) **General.** Outdoor tents or cloth-covered structures may be erected for a period of not more than 120 days if constructed in accordance with this Section.

(b) **Use.** Outdoor tents or cloth-covered structures shall be used only for assembly purposes.

EXCEPTIONS: 1. *Outdoor tents of cloth-covered structures not exceeding 12 feet in width may be used for purposes accessory to an indoor assembly use on the site.*

2. *During the month of December only, outdoor tents may be used for office or other purposes accessory to a Christmas tree sales lot, provided the trees are not displayed or sold within the tents.*

(c) **Construction.** Outdoor tents and cloth-covered structures shall be erected in conformance with standards which have been approved by and which are on file with the Department.

(d) **Aisles and Exits.** Every portion of the area under any tent or cloth-covered structure shall be within 100 feet of an exit.

Arrangement and widths of aisles and exits shall conform to the requirements of Division 33 of this Article as required for a building.

(e) **Fire Department Approval.** Fire Department approval is required prior to the issuance of any permit for a tent or cloth-covered structure.

RULE OF GENERAL APPLICATION #2-68 APPLIES. SEE APPENDIX LISTING.

SEC. 91.1710 — BLEACHERS, GRANDSTANDS AND ASSEMBLY PLATFORMS

(a) **General.** The construction of all bleachers, grandstands, and assembly platforms, either temporary or permanent, shall conform to the requirements of this Section.

(b) **Aisles and Exits.** Aisles and seating arrangements shall conform to the requirements of Division 33 of this Article.

(c) **Construction.** All bleachers, grandstands and assembly platforms shall be constructed of incombustible materials except for seats, footboards, or platform flooring.

EXCEPTION: *Temporary bleachers, grandstands, or assembly platforms not exceeding 11 rows of seats or eight feet in height may be constructed of wood not less than 1½ inches in thickness. All wood members and their connections shall be maintained in a structurally safe condition. Such wood structure shall not be permitted for a period of more than 120 days.*

(d) **Design.** The design of all bleachers, grandstands and assembly platforms shall conform to the requirements of Division 23 of this Article.

(e) **Footings.** All assembly structures shall be erected upon a permanent foundation.

EXCEPTION: Temporary bleachers or platforms may be supported on wood or metal base plates, sills, floor runners or sleepers.

(f) **Portable Assembly Structures.** Each portable assembly structure shall be a complete and separate unit capable of resisting all design loads and forces.

SEC. 91.1711 — GLAZING OF OPENINGS

(a) **General.** Glazing of openings in the exterior walls of buildings and all glazed openings subject to human impact shall conform to the requirements of this Section. Openings required to be fire protected shall also comply with the fire-resistive-construction requirements specified elsewhere in this Code. Plastic materials may be used as glazing where specifically permitted in this Section.

EXCEPTIONS: 1. The glazing of openings in the following cases is excepted from the requirements of Subsections (b) and (c) of this Section:

A. First story openings of all buildings.

B. Openings of two- and three-story residential buildings where the walls which contain glass are not closer to a public way than one-half the vertical distance from the ground to the top of the glazed openings.

C. Openings located over balconies or level roofed areas where the balconies or level roofed areas have a surface width equal to at least one-half of the vertical distance from the surface to the top of the glazed opening.

D. Louver windows where the individual louvers are not over $1\frac{1}{2}$ square feet in area.

2. Bathtub or shower enclosures shall comply with the requirements of Section 91.4909.

(b) **Area Limitations.** All glass used for glazing exterior openings shall be limited in area and thickness as shown by Table No. 17-C or as modified by Table No. 17-D.

EXCEPTION: The following formula may be used in determining the maximum allowable glass area for square panes of glass thickness not exhibited in Table No. 17-C:

$$A = 768T^2$$

WHERE:

A — is the allowable glass area in square feet, and

T — is the glass thickness in inches.

For rectangular shapes the allowable area computed by the above formula shall be modified by values exhibited in Table No. 17-D.

(c) **Glazing.** All glass shall be completely surrounded by a metal frame and shall be installed in accordance with requirements set forth in Table No. 17-E.

(d) **Impact Hazard Glazing.** Glazing in locations which may be subject to human impact such as frameless glass doors, glass entrance and exit doors, fixed glass panels, sliding glass doors, shower doors, and tub enclosures shall meet the requirements set forth in Table No. 17-F.

EXCEPTION: Glazed openings, which extend no lower than 18 inches above the adjacent finished floor walking surface or glass lights which have a least dimension no greater than 18 inches, need not comply with this Subsection.

(e) **Plastic Material for Glazing.** Approved plastics may be used as glazing for openings in the exterior walls of buildings, provided:

1. The aggregate area of plastic shall not exceed 30 percent of the area of the wall face of the story in which it is installed.

2. Plastic shall be limited to use in openings not over three stories above adjacent grade.

3. In stories above the first story, the area of a single pane of plastic shall not exceed 12 square feet and the vertical dimension of a unit or pane shall not exceed three feet.

4. Assemblies of plastic glazing shall be separated vertically by at least four feet of incombustible wall surfacing material.

5. Plastic shall be completely surrounded by a metal frame and shall be installed in accordance with requirements set forth in Table No. 17-E.

6. Such openings shall not be construed to meet the requirements of clear and unobstructed openings as provided for in the exception to Subsection 91.1704(e) for the waiver of automatic sprinkler systems.

TABLE NO. 17-C — MAXIMUM PERMISSIBLE AREAS OF GLASS

Glass Thickness (Inches)	Single Strength	Double Strength	1/8"	3/16"	13/64"	7/32"	1/4"	5/16"	3/8"	1/2" and over
	.085" to .100"	0.115" to 0.133"								
Area* (Square Feet)	5.8	10.85	12	27	32	37	48	75	108	190

*Area shown are for square panes of glass mounted in a vertical position. Glass mounted at a slope not to exceed one horizontal to five vertical may be considered as vertical.

TABLE NO. 17-D — AREA ADJUSTMENT FACTORS FOR RECTANGULAR SHAPES

Ratio (S/L)	Factor (F)	Ratio (S/L)	Factor (F)
1.0	1.00	0.5	.94
0.9	.94	0.4	1.05
0.8	.90	0.3	1.32
0.7	.88	0.2	1.92
0.6	.89	0.1	4.00

NOTES: 1. S/L is equal to short side divided by long side.

2. Factors for intermediate ratios of S/L may be obtained by interpolation.

**TABLE NO. 17-E
MINIMUM GLAZING REQUIREMENTS**

Glass Area	FIXED WINDOWS & OPENABLE WINDOWS OTHER THAN HORIZONTAL SLIDING				
	Up to 6 sq. ft.	6 to 14 sq. ft.	14 to 32 sq. ft.	32 to 50 sq. ft.	Over 50 sq. ft.
Minimum Glass Grip	1/4"	1/4"	5/16"	3/8"	1/2"
Minimum Glass Edge Clearance	1/8" (notes 1, 2)	1/8" (notes 1, 2)	3/16" (note 1)	1/4" (note 1)	1/4" (note 1)
Continuous Metal Stop Beads	Required above 3rd Story	Required	Required	Required	Required
Resilient Setting Material	Not Required	Required (note 3)	Required (note 3)	Required (note 3)	Required (note 3)

(Table Continued on Next Page)

TABLE NO. 17-E (Cont.)
MINIMUM GLAZING REQUIREMENTS
Sliding Doors and Horizontal Sliding Windows

Glass Area	Up to 14 sq. ft.	14 to 32 sq. ft.	32 to 50 sq. ft.	Over 50 sq. ft.
Minimum Glass Grip	1/4"	5/16"	3/8"	1/2"
Minimum Glass Edge Clearance	1/8" (note 2)	3/16"	1/4"	1/4"
Continuous Metal Stop Beads	Required above 3rd Story	Required	Required	Required
Resilient Setting Material	Not Required	Not Required	(note 3) Required	(note 3) Required

NOTES: (1) Glass edge clearance in fixed openings shall be not less than that required to provide for wind or earthquake drift.

(2) Glass edge clearance at all sides of pane shall be a minimum of 3/16" where height of glass exceeds 3 feet.

(3) Resilient setting material shall include preformed rubber or vinyl plastic gaskets and other materials which are proved to the satisfaction of the Superintendent of Building to remain resilient.

TABLE NO. 17-F
IMPACT HAZARD GLAZING

Hazardous Location	Size of Each Glazed Area	Requirement (1), (2), (3)
Glazing in Framed Exit and Entrance Doors and Fixed Glazed Panels	Over 6 square feet	Impact Hazard Glazing or Protected Glazing
Glazing in Sliding Door Assemblies (Both fixed and sliding panels)	Over 6 square feet	Impact Hazard Glazing
Glass in Unframed Doors (Swinging)	All sizes	Fully Tempered Glass
Glazing in Shower Doors and Tub Enclosures	All sizes	As specified in Section 91.4909

NOTES: (1) Annealed glass less than single strength (SS) in thickness shall not be used.

(2) If short dimension is larger than 24 inches, annealed glass must be double strength (DS) or thicker.

(3) When proven by comparative tests to produce performance and safety equivalent to materials required in this Table, other glazing materials may be approved by the Department.

For the provisions of Table No. 17-F the following definitions apply:

1. Impact Hazard Glazing shall be glass approved by the Department as conforming to ANSI Standard Z97.1.

2. Protected Glazing shall be annealed glass (regular plate, float, sheet, rolled or obscure) of not less than 3/16-inch nominal thickness and protected on each exposed side by grills or push bars firmly and permanently attached to the stiles. The grill or bars shall be located and constructed so as to restrict human

impact (adults or children) from being delivered to the glass surface.

3. Fully Tempered Glass shall conform to ANSI Standard Z97.1.

SEC. 91.1712 — HELIPORTS AND HELISTOPS SPECIAL PROVISIONS

(a) General. Heliports and helistops may be erected on buildings or other locations if they are constructed in accordance with this section.

(b) Size. The touch down or landing area for helicopters of less than 3500 pounds shall be a minimum of 20 feet x 20 feet in size. The touch down area shall be surrounded on all sides by a clear area having a minimum width of 15 feet.

(c) Design. The structural design of all helicopter landing areas shall comply with the design loads specified in Section 91.2307(e) of this Article.

(d) Exits and Stairways. Exits and stairways from heliports and helistops shall comply with the provisions of Division 33 of this Article, except that all landing areas located on buildings or structures shall have two or more exits. For landing platforms or roof areas less than 60 feet in length or less than 2000 square feet in area, the second exit may be a fire escape or ladder leading to the floor below.

(e) Guardrails. Guardrails shall be provided around all roofs or decks which are more than 4 feet above the adjoining ground or floor level and shall comply with the provisions of Section 91.4404 of this Article.

(f) Fire Department and Federal Aviation Approval. Before operating helicopters from heliports or helistops, approval must be obtained from the Los Angeles City Fire Department and the Federal Aviation Agency.

DIVISION 18 — TYPE I BUILDINGS

SEC. 91.1801 — GENERAL

(a) **Scope.** In addition to other requirements of this Code, every Type I building shall comply with the requirements of this Division.

SEC. 91.1802—TYPE I BUILDINGS OVER 75 FEET IN HEIGHT

(a) **General.** Every Type I building over 75 feet in height shall comply with the provisions of this Section.

(b) **Emergency Fire Fighting Facilities.** Emergency fire fighting facilities shall be provided as required by Article 7, Chapter V, of the Los Angeles Municipal Code (Fire Code).

(c) **Automatic Fire Sprinkler Systems.** An automatic fire sprinkler system shall be installed to provide complete coverage of all areas of the building.

EXCEPTION: Sprinklers need not be installed in locations expressly excepted in the Los Angeles Plumbing Code, provided other approved fire protection equipment is installed.

(d) **Elevator Vestibules.** Every elevator, or bank of elevators, shall open only into an enclosed vestibule. Required vestibules shall have a clear ceiling height of not less than eight feet, shall extend to the outermost elevator shaft walls and shall measure not less than 10 feet from the elevator door to the opposite side of the vestibule. Vestibules shall be constructed with walls, floors, and ceilings having a fire-resistance rating of not less than one hour. All vestibule openings other than those for elevator doors, stairway enclosures, and ducts shall be protected with three-fourths-hour self-closing fire assemblies actuated by "Combustion Products" type smoke detectors.

EXCEPTION: Vestibules are not required in any story in which exits give direct egress to the exterior of the building.

(e) **Stair Shaft Emergency Escape.** Stair shaft enclosures shall be provided with one door openable to the interior of the building in each five-story portion. Such openable doors shall be arranged so that not more than four levels containing locked exits shall exist between levels containing openable doors. The door shall be openable from the stairway side without the use of a key or special knowledge and shall be identified by a sign on the stairway side bearing the words "ALTERNATE EMERGENCY ESCAPE." Security alarm systems may be used on these doors.

(f) **Stair Shaft Emergency Smoke Control System.** Each enclosed stair shaft shall be provided with an emergency mechanical ventilation system complying with Article 5, Chapter IX, of the Los Angeles Municipal Code (Heating, Ventilating and Air Conditioning Code).

Whenever the emergency ventilation system is activated, all stair shaft doors which have hold-open devices shall be automatically released to close.

DIVISION 23 — LOADS AND GENERAL DESIGN

SEC. 91.2301 — GENERAL

(a) **Definitions.** For the purpose of this Division, certain terms are defined as follows:

Dead Load. The weight of materials forming a permanent part of the building, including permanent partitions.

Horizontal Force. A horizontal force caused by wind pressure or earthquake effect.

Live Load. Any load other than a "dead load" or a "horizontal force."

(b) **Stress Analysis.** The principles of mechanics shall be used in computing the stresses in every structure.

EXCEPTION: Where provided in this Code, specific arbitrary methods of analysis may be used.

(c) **Combined Axial and Flexural Stresses.** Except as provided in Division 26 for concrete columns and Division 27 for steel columns, members subject to combined axial and flexural stresses shall be so proportioned that the quantity

$$\frac{f_a}{F_a} + \frac{f_b}{F_b} \text{ shall not exceed } 1$$

WHERE:

f_a = Computed axial unit stress.

F_a = Axial unit stress permitted by this Code, if member were carrying axial load only, including any increase in stress allowed by this Section.

f_b = Computed flexural unit stress.

F_b = Flexural unit stress permitted by this Code, if member were carrying bending load only, including any increase in stress allowed by this Section.

(d) **Continuity.** If connections are capable of resisting moments, the effect of continuity may be included among the factors used in proportioning members.

Where the effect of continuity is included among the design factors, every element of the structure shall be designed to resist any stress arising from continuity, including a total temperature change of 40 degrees Fahrenheit.

(e) **Eccentricity.** Due allowance shall be made for the effect of eccentricity.

EXCEPTION: Stresses due to eccentricity may be neglected if they do not exceed 10% of the axial stress.

(f) **Lateral Support of Compression Members.** Structural elements assumed to act as lateral support for a compression member or the compression flange of a beam shall be capable of resisting, either in tension or compression, a force equal to 2% of the axial force in the compression member or the resultant force on the compression area of the beam.

(g) **Increases in Stresses.** The allowable stresses and soil-bearing values specified in this Code for working stress design may be increased one-third when considering wind or earthquake forces from a Static Analysis in accordance with the provisions and limitations of Section 91.2305(d) 2, either alone or when combined with vertical loads.

Load factors for strength design of concrete and plastic design of steel shall be as indicated in the appropriate sections on material.

Wind and earthquake loads need not be assumed to act simultaneously.

(h) **Column Stress.** The allowable axial stress in columns at points of lateral support may be that allowed for short columns.

(i) **Camber Deflection of Roof Members.** All roofs shall be designed with sufficient slope or camber to assure adequate drainage after the dead load deflection due to initial set and long time deformation has taken place.

EXCEPTION: Roofs may be constructed level if the dead load deflection pockets due to initial set and long time deformation do not exceed $\frac{1}{2}$ -inch in depth below the drainage invert, and no point deflects more than $\frac{1}{2}$ -inch for a 5-pound per square foot live load on all or alternate spans. Cantilever members drained at the unsupported end need not meet these deflection requirements.

SEC. 91.2302 — LIVE LOADS

(a) **General.** Every portion of every building shall sustain, within the stress limitation of this Code, all "dead loads" plus the unit "live loads" exhibited in Table No. 23-A. The "live loads" shall be assumed to act vertically upon the area projected upon a horizontal plane.

EXCEPTIONS: 1. Greenhouses and lath houses shall be designed for a vertical live load of not less than five pounds per square foot.

2. Wind load shall be used in place of roof live loads, where such loading will result in larger members or connection.

(b) **Storage.** Floor areas used for storage or for heavy equipment shall be designed to support the actual loads if they exceed the values exhibited in Table No. 23-A.

(c) **Partition Loads.** In addition to the loads exhibited in Table No. 23-A, room areas in Groups F and G Occupancies

TABLE NO. 23-A — ALLOWABLE LIVE LOAD

Portion of Building	Live Load (lbs. per sq. ft.)
Residential rooms, school classrooms, hospital rooms.....	40
Office rooms, library reading rooms, rest rooms and assembly rooms with sloping or stepped floors.....	50
Stairways, Grandstands and Bleachers, Assembly Platforms and Reviewing Stands.....	100
Corridors.....	Same as Area Served
Heavy Storage including heavy automotive trucks.....	200
Wharves used for storage.....	300
All other portions.....	100

ROOF SURFACE	Roof Live Loads In Pounds Per Square Foot		
	Tributary Loaded Area In Square Feet for Any Structural Member		
	0 to 200	201 to 600	Over 600
Flat or rise less than 4" per ft.....			
Arch or dome with rise less than $\frac{1}{4}$ of the span.....	20	16	12
Rise 4" per ft. to less than 12" per ft.....			
Arch or dome with rise $\frac{1}{4}$ span to less than $\frac{1}{2}$ span or with radius $\frac{1}{4}$ or greater of the span.....	16	14	12
Rise 12" per ft. and greater.....			
Arch or dome with rise $\frac{1}{2}$ span or greater, or radius less than $\frac{1}{4}$ of the span.....	12	12	12

SPECIAL STRUCTURES:

Passenger Automobile Storage Without Floors.....	6000 lbs. per Vehicle Space
Passenger Automobile Parking and Storage.....	50 lbs. per Square Foot
Fixed or Portable Grandstands and Bleachers, Stadiums, Assembly Platforms and Reviewing Stands, Seats and Footboards.....	100 lbs. per Square Foot

larger than 300 square feet shall be designed to support a partition load assumed to be 20 pounds per square foot.

EXCEPTIONS: 1. Such partition load need not be applied to floors designed for more than 70 pounds per square foot live load. The partition load shall, however, be included in the determination of the horizontal forces.

2. The partition load is not required in passenger automobile parking structures.

(d) ➤ **Loading Notice.** Loading notices shall be posted:

1. In every room or area used for industrial purposes or storage.

2. On every storage rack over 12 feet in height or supporting a storage load of more than 50 pounds per square foot of shelf area.

The loading notice as required herein shall be corrosion-resistant metal and not less than eight inches by ten inches in size and shall be posted in a conspicuous location. <

SEC. 91.2303 — REDUCTION OF LIVE LOADS

The following reductions in unit live loads shown in Table No. 23-A for floors shall be permitted in the designing of columns, piers, walls, foundations, trusses, beams, and flat slabs:

Except for places of public assembly, and except for live loads greater than 100 pounds per square foot, the design live load on any member supporting 150 square feet or more may be reduced at the rate of 0.08% per square foot of area supported by the member. The reduction shall not exceed 60% nor "R" as determined in the following formula:

$$R = 23.1 \left\{ 1 + \frac{D}{L} \right\} \text{ in which}$$

D = Dead Load per square foot of area supported by the member

L = Unit Live Load per square foot of area supported by the member

R = Reduction in per cent

For storage live loads exceeding 100 pounds per square foot, no reduction shall be made except design live loads on columns may be reduced 20%.

No reductions shall be permitted for portions of structures designed for live loads as set forth in Table No. 23-A for "Special Structures."

SEC. 91.2304 — ARRANGEMENT OF LIVE LOADS

(a) **General.** Except where arbitrary moment coefficients are allowed by this Code, every member shall be designed to withstand the greatest stresses arising from any arrangement of live loads.

EXCEPTIONS: The maximum bending moments may be assumed to occur when the prescribed uniform load is applied as follows:

1. **Maximum Positive Moment**—Alternate spans loaded, with a maximum of three loaded spans.

2. **Maximum Negative Moment**—Two adjacent spans loaded, other spans unloaded.

(b) **Trusses, Arches and Rigid Bents.** Trusses, arches, and rigid bents shall be designed to resist the stress caused by unit live loads on $\frac{1}{4}$ the span measured from the support if such loading results in reverse stresses, or stresses greater in any portion than the stresses produced by the required unit live load upon the entire span. For roofs whose structure is com-

posed of a stressed shell, framed or solid, wherein stresses caused by any point loading are distributed throughout the area of the shell, the requirements for unbalanced unit live load design may be reduced 50%.

(c) Columns. In multi-story buildings, columns may be designed for the vertical load resulting when all spans are loaded.

SEC. 91.2305 — HORIZONTAL FORCES

(a) General. These lateral force requirements are intended to provide minimum standards as design criteria toward making buildings and other structures wind and earthquake resistant.

TABLE NO. 23-B
HORIZONTAL FORCE FACTOR " C_p " FOR PARTS OR
PORTIONS OF BUILDINGS OR OTHER STRUCTURES⁽¹⁾

Part or Portion of Buildings	Direction of Force	Value of C_p
Exterior bearing and non-bearing walls, interior bearing walls and partitions, interior non-bearing walls and partitions over ten feet in height, masonry fences over six feet in height.	Normal to Flat Surface	0.20
Cantilever parapet and other cantilever walls, except retaining walls.	Normal to Flat Surface	1.00
Exterior and interior ornamentations and appendages.	Any Direction	1.00
When connected to or a part of a building: towers, tanks, towers and tanks plus contents, racks over 8 feet 3 inches in height plus contents, chimneys, smokestacks, and penthouses.	Any Direction	0.20 ⁽²⁾⁽⁴⁾
When connected to or a part of a building: Rigid and rigidly mounted equipment and machinery not required for continued operation of essential occupancies. ⁽⁵⁾	Any Horizontal Direction	0.20 ⁽²⁾
Tanks plus effective contents resting on the ground.	Any Direction	0.12
Floors and roofs acting as diaphragms.	In the plane of the diaphragm	0.12 ⁽⁶⁾
Prefabricated structural elements, other than walls, with force applied at center of gravity of assembly.	Any Horizontal Direction	0.30
Connections for exterior panels or elements complying with Section 91.2305.	Any Direction	2.00

NOTES:

(1) See Section 91.2305(k)8 for use of C_p .

(2) When located in the upper portion of any building with an $\frac{h_a}{D}$ ratio of 5 to 1 or greater the value shall be increased by 50%.

(3) For flexible and flexibly mounted equipment and machinery, the appropriate values for C_p shall be determined with consideration given to both the dynamic properties of the equipment and machinery and to the building or structure in which it is placed.

(4) The W_p for storage racks shall be the weight of the racks plus contents. The value of C_p for racks over two storage support levels in height shall be 0.16 for the levels below the top two levels.

(5) The design of the equipment and machinery and their anchorage is an integral part of the design and specification of such equipment and machinery. The structure to which the equipment or machinery is mounted shall be capable of resisting the anchorage forces [see also Section 91.2305(l)].

(6) Floor and roofs acting as diaphragms shall be designed for a minimum force resulting from a C_p of .12 applied to w_x unless a greater force results from the distribution of lateral forces in accordance with Section 91.2305(d)2C.

TABLE NO. 23-C
HORIZONTAL FORCE FACTOR "K" FOR BUILDINGS OR
OTHER STRUCTURES⁽¹⁾

Type or Arrangement of Resisting Elements	Value of K
All building framing systems except as hereinafter classified.	1.00
Buildings with a box system as defined in Section 2305(b).	1.33
Buildings with a dual bracing system consisting of a ductile moment-resisting space frame and shear walls or braced frames designed in accordance with the following criteria: 1. The frames and shear walls or braced frames shall resist the total lateral force in accordance with their relative rigidities considering the interaction of the shear walls and frames. 2. The shear walls or braced frames acting independently of the ductile moment-resisting space frame shall resist the total required lateral force. 3. The ductile moment-resisting space frame shall have the capacity to resist not less than 25% of the required lateral force.	0.80
Buildings with a ductile moment-resisting space frame designed in accordance with the following criteria: 1. The ductile moment-resisting space frame shall have the capacity to resist the total required lateral force.	0.67
Elevated tanks plus contents supported on four or more cross-braced columns and not supported by a building. ^{(2), (3)}	2.5
Structures other than buildings and other than those listed in Table 23-B.	2.0

NOTES:

- (1) Where wind load as set forth in Subsection 91.2305(n) would produce higher stresses, this load shall be used in lieu of the loads resulting from earthquake forces.
(2) The torsional requirements of Section 91.2305(g) shall apply.
(3) See Section 91.2305(d)2A for additional detail requirements.

The provisions of this Section apply to the structure as a unit and also to all parts thereof, including the structural frame or walls, floor and roof systems, and other structural features.

Where the provisions of this Section are not directly applicable to the design of a structure, the Department of Building and Safety may make such interpretations as are necessary to provide safety against horizontal forces at least equivalent to that provided in a structure to which the provisions of this Section are directly applicable.

Where, in the opinion of the Superintendent of Building, the design of a structure, due to the unusual configuration of the structure or parts of the structure or assembly of structural materials therein, does not provide at least the same safeguard against earthquake as provided by the applicable portions of this Section when applied in the design of a similar structure of customary configuration, framing and assembly of materials, the Department shall have the authority to withhold the building permit.

Every portion of every structure shall be designed to resist the lateral forces of wind or earthquake, whichever is greater.

EXCEPTION: The requirements of this Section shall not

apply to any conventionally framed one-story, Type V building accessory to a dwelling, provided the building is not of an unusual shape or size and not subjected to unusual loading conditions.

Stresses shall be calculated as the effect of a force applied horizontally at each floor and each roof level above the foundation. The force shall be assumed to act in any horizontal direction.

(b) **Definitions.** The following definitions apply to the provisions of this section:

Base: The level at which the earthquake motions are considered to be imparted to the structure or the level at which the structure as a dynamic vibrator is supported.

Box System: A structural system without a complete vertical load-carrying space frame. In this system the required lateral forces are resisted by shear walls as hereinafter defined.

Braced Frame: A truss system or its equivalent which is provided to resist lateral forces and in which the members are subjected primarily to axial stresses.

Ductile Moment Resisting Space Frame: A moment resisting space frame complying with the requirements given in Sections 91.2622 and 91.2703.

Essential Facilities: Those structures or buildings which must be safe and usable for emergency purposes after an earthquake in order to preserve the peace, health and safety of the general public. Such facilities shall include the following:

Hospitals and other medical facilities having surgery or emergency treatment areas; fire and police stations; and municipal government disaster operation and communication centers.

Lateral Force Resisting System: That part of the structural system assigned to resist the lateral forces prescribed in Section 91.2305(d).

Moment Resisting Space Frame: A vertical load carrying space frame in which the members and joints are capable of resisting forces primarily by flexure.

Shear Wall: A wall designed to resist lateral forces parallel to the wall. Braced frames subjected primarily to axial stresses shall be considered as shear walls for the purpose of this definition.

Space Frame: A three-dimensional structural system, without bearing walls, composed of interconnected members laterally supported so as to function as a complete self-contained unit with or without the aid of horizontal diaphragms or floor bracing systems.

Vertical Load Carrying Space Frame: A space frame designed to carry all vertical loads.

(c) **Symbols and Notations.** The following symbols and notations apply only to the provisions of this Section.

- C = Numerical coefficient for base shear as specified in Section 91.2305(d)2.
- C_p = Numerical coefficient as specified in Section 91.2305(k)8 and as set forth in Table No. 23-B.
- D = The dimension of the building in feet in a direction parallel to the applied force.
- F_a = Allowable axial stress.
- f_a = Computed axial stress.
- F_b = Allowable bending stress.
- f_b = Computed bending stress.
- f_l = Distributed lateral force required to produce a deflection δ_l at level i.

- F_l, F_n, F_x = Lateral force applied to level i , n , or x , respectively.
 F_p = Lateral forces on a part of the structure and in the direction under consideration.
 F_t = That portion of V considered concentrated at the top of the structure in addition to F_n .
 g = Acceleration due to gravity.
 h_i, h_n, h_x = Height in feet above the base to level i , n , or x , respectively.
 I = Occupancy importance coefficient.
 K = Numerical coefficient as set forth in Table No. 23-C.
 Level i = Level of the structure referred to by the subscript i .
 i = 1, designates the first level above the base.
 Level n = That level which is uppermost in the main portion of the structure.
 Level x = That level which is under design consideration.
 x = 1, designates the first level above the base.
 N = The total number of stories above the base to level n .
 S = Numerical coefficient for site-structure resonance.
 T = Fundamental elastic period of vibration of the structure in seconds in the direction under consideration.
 T_s = Characteristic site period.
 V = The total lateral force or shear at the base.
 W = Total dead load and applicable portions of other loads.
 w_i, w_x = That portion of W which is located at or is assigned to level i or x respectively.
 W_p = The weight of a portion of a structure.
 δ = Deflection at level i relative to the base due to applied lateral forces.

(d) **Minimum Earthquake Forces for Structures. 1. Dynamic Analyses.** Every structure shall have structural capacity sufficient to resist the effects of earthquakes as determined by a dynamic analysis. This analysis shall be based on the ground shaking prescribed for the site in a soil-geology-seismology report. Every soil-geology-seismology report shall be subject to review and approval by the Department. Reports not approved by the Department shall not be used for the design of any structure.

EXCEPTION: Structures 160 feet or less in height, essentially regular in shape and in stiffness over their height, may be designed for earthquake force specified in Subdivision 2 of this Subsection.

2. Static Analyses.

A. General. Any structure 160 feet or less in height, essentially regular in shape and stiffness over its height, may be designed under the provisions of this Subdivision.

All members in braced frames and their connections shall be designed for 1.25 times the force determined under the provisions of this Subdivision.

The connections of all chords, ties, struts, and similar primary members, and connections between precast concrete elements which are designed to transfer the forces determined under the provisions of this Subdivision, shall not be permitted the $\frac{1}{2}$ stress increase specified in Section 91.2301(g) unless they are designed to develop the structural capacity of the member. Structural capacity as referred to herein shall be the strength at yield level. Where the structural capacity of a material has not been established, the Department may approve values when substantiating data has been provided.

Buildings or structures which have highly irregular shapes, large differences in lateral resistance or stiffness between adjacent stories, or other unusual structural features significantly af-

fecting dynamic response, shall be designed under the provisions of Subdivision 1 of this Subsection.

B. Design. Every structure shall be designed and constructed to resist minimum total lateral seismic force assumed to act non-concurrently in the direction of each of the main axes of the structure in accordance with the following equation:

$$V = I K C S W \quad 1.33 \times .14 = .186 \quad (23-1)$$

The value for I equals 1.5 for essential facilities. For all others I shall not be less than 1.0.

The value of K shall be not less than that set forth in Table 23-C.

The values of C and S are as indicated hereafter except that the product of C S need not exceed 0.14.

The value of W is the total dead load and applicable portions of other loads such as: partitions, permanent equipment, snow, and a minimum of 25 percent of the floor live load in storage and warehouse occupancies.

The value of C shall be determined in accordance with the following equation:

$$C = \frac{1}{15(T)^{\frac{1}{2}}} \quad (23-2)$$

The value of C need not exceed 0.12.

The period T shall be established using the structural properties and deformational characteristics of resisting elements in a properly substantiated analysis such as the following equation:

$$T = 2 \pi \frac{\left[\sum_{i=1}^n w_i \delta_i^2 \right]^{\frac{1}{2}}}{g \sum_{i=1}^n f_i \delta_i} \quad (23-3)$$

Where the values of f_i and δ_i shall be determined from the base shear V distributed approximately in accordance with the principles of equations 23-5, 23-6, and 23-7, or any other arbitrary base shear with a rational distribution.

In the absence of a period determination as indicated above, the value of T for buildings may be determined by the following equation:

$$T = \frac{0.05 h_n}{D^{\frac{1}{2}}} \quad (23-3A)$$

or, for buildings in which the lateral force resisting system consists of moment resisting space frames capable of resisting 100 percent of the required lateral forces and such system is not enclosed by or adjoined by more rigid elements tending to prevent the frame from resisting lateral forces.

$$T = 0.10N \quad (23-3B)$$

The value of S shall be determined by the following equations but shall not be less than 1.0:

$$\text{For } \frac{T}{T_s} = 1.0 \text{ or less,}$$

$$S = 1.0 + \frac{T}{T_s} - 0.5 \left[\frac{T}{T_s} \right]^2 \quad (23-4)$$

For $\frac{T}{T_s}$ greater than 1.0,

$$S = 1.2 + 0.6 \frac{T}{T_s} - 0.3 \left[\frac{T}{T_s} \right]^2 \quad (23-4A)$$

T in equations 23-4 and 23-4A shall be established by a properly substantiated analysis but T shall not be taken as less than 0.3 seconds.

The range of values of T_s may be established from properly substantiated geotechnical data, except that T_s shall not be taken as less than 0.5 seconds nor more than 2.5 seconds. T_s shall be that value within the range of site periods, as determined above, that is nearest to T.

When T_s is not properly established, the value of S shall be 1.5.

EXCEPTION: Where T_s has been established by a properly substantiated analysis and exceeds 2.5 seconds, the value of S may be determined by assuming a value of 2.5 seconds for T_s .

C. Distribution of Lateral Forces. In structures having regular shapes or framing systems the total lateral force V shall be distributed over the height of the structure in accordance with equations 23-5, 23-6 and 23-7.

$$V = F_t + \sum_{i=1}^n F_i \quad (23-5)$$

$$F_t = 0.07 VT \quad (23-6)$$

The concentrated force at the top, F_t , need not exceed 0.25V and may be considered as zero where T is 0.7 seconds or less. The remaining portion of the total base shear V shall be distributed over the height of the structure including level n according to the following equation:

$$F_x = \frac{(V - F_t) w_x h_x}{\sum_{i=1}^n w_i h_i} \quad (23-7)$$

At each level designated as x, the force F_x shall be applied over the area of the building in accordance with the mass distribution on that level.

D. Setbacks. Buildings having setbacks wherein the plan dimension of the tower in each direction is at least 75 percent of the corresponding plan dimension of the lower part may be considered as uniform buildings without setbacks, provided other irregularities as defined in this Section do not exist.

E. Drift Provisions. Lateral deflections or drift of a story relative to its adjacent stories shall not exceed 0.005 times the story height unless it can be demonstrated that greater drift can be tolerated. The displacement calculated from the application of the required lateral forces shall be divided by the numerical coefficient K to obtain the drift. However, the value of the numerical coefficient K shall not be taken greater than 1.0.

(e) **Distribution of Horizontal Shear.** Total shear in any horizontal plane shall be distributed to the various elements of the lateral force resisting system in proportion to their rigidities considering the rigidity of the horizontal bracing system or diaphragm. Rigid elements that are assumed not to be part of the lateral force-resisting system may be incorporated into buildings, provided that their effect on the action of the system is considered and provided for in the design.

(f) **Drift.** Lateral deflections or drift of a story relative to its adjacent stories shall be considered in accordance with accepted engineering practice.

(g) **Horizontal Torsional Moments.** Provisions shall be made for the increase in shear resulting from horizontal torsion due to an eccentricity between the center of mass and the center of rigidity. Negative torsional shears shall be neglected. In addition, where the vertical resisting elements depend on diaphragm action for shear distribution at any level, the shear resisting elements shall be capable of resisting a torsional moment assumed to be equivalent to the story shear acting with an eccentricity of not less than 5% of the maximum building dimension at that level.

(h) **Overturning.** Every building or structure shall be designed to resist the overturning effects caused by the wind forces as set forth in Subsection (n) of this Section and related requirements or the earthquake forces specified in this Section, whichever governs.

At any level, the incremental changes of the design overturning moments, in the story under consideration, shall be distributed to the various resisting elements in the same proportion as the distribution of the shears in the resisting system. Where other vertical members are provided which are capable of partially resisting the overturning moments, a redistribution may be made to these members if framing members of sufficient strength and stiffness to transmit the required loads are provided.

Where a vertical resisting element is discontinuous, the overturning moment carried by the lowest story of that element shall be carried down as loads to the foundation.

(i) **Essential Facilities.** Building elements and necessary equipment of Essential Facilities shall be designed, detailed and constructed to withstand the maximum acceleration and deflections of the structure without disrupting the operations or services. The lateral force used for design shall not be less than that required by Section 91.2305(k)8.

(j) **Structural Systems. 1. Special Requirements.**

A. All buildings designed with a horizontal force factor " K " = 0.67 or 0.80 shall have ductile moment resisting space frames.

B. Buildings more than 160 feet in height shall have ductile moment resisting space frames capable of resisting not less than 25 percent of the required seismic forces for the structure as a whole.

C. All concrete space frames required by design to be part of the lateral force resisting system and all concrete frames located in the perimeter line of vertical support shall be ductile moment resisting space frames.

EXCEPTION: Frames in the perimeter line of vertical support of buildings designed with shear walls along the same perimeter lines which take 100 percent of the design lateral forces need only be checked for conformance with the following sub-item D.

D. All framing elements not required by design to be part of the lateral force resisting system shall be investigated and shown to be adequate for vertical load and induced moment due to 3.0 divided by the numerical coefficient K times the distortions resulting from the code-required lateral forces. The rigidity of other elements shall be considered in accordance with Section 91.2305(e).

E. Moment resisting space frames and ductile moment resisting space frames may be enclosed by or adjoined by more rigid elements which would tend to prevent the space frames from resisting lateral forces where it can be shown that the action or failure of the more rigid elements will not impair the vertical and lateral load resisting ability of the space frames.

2. Construction. A. A ductile moment resisting space frame shall consist of a moment resisting frame of structural steel conforming to Section 91.2702 of this Code, or by a reinforced concrete frame complying with Section 91.2622 of this Code.

B. Shear walls in buildings where "K" equals 0.80 shall be composed of axially loaded bracing members of ASTM A36, A440, A441, A572 (except Grades 60 and 65) or A588 structural steel, or reinforced concrete as provided in the following paragraph. Reinforced concrete shear walls and reinforced concrete braced frames for all buildings shall conform to the requirements of Section 91.2623 of this Code.

C. In buildings where "K" equals 0.67 or 0.80, all structural elements below the base required to transmit lateral forces to the foundation shall meet the special ductility requirements of structural steel complying with Section 91.2703 or of reinforced concrete complying with Sections 91.2622 and 91.2623.

(k) Design Requirements. 1. Combined axial and bending stresses in columns. Except for reinforced concrete columns designed in accordance with Division 26 of this Code and except for structural steel columns designed in accordance with Division 27 of this Code, all structural columns shall conform to this Subdivision. The maximum allowable extreme of fiber stress in columns at intersection of columns with floor beams or girders for combined axial and bending stress shall be the allowable bending stresses for the material used. Within the center one-half of the unsupported length of the column, the combined axial and bending stresses shall be such that:

$$\frac{f_a}{F_a} + \frac{f_b}{F_b} \text{ is equal to or less than } 1.$$

When stresses are due to a combination of vertical and lateral loads, the allowable unit stresses may be increased as specified in Subsection 91.2301(g).

2. Minor Alterations. Minor alterations may be made in existing buildings and other structures, but the resistance to lateral forces shall be not less than that before such alterations were made, unless the building as altered meets the requirements of this section of the Code.

3. Reinforced Masonry or Concrete. All elements within a structure which are of masonry or concrete shall be reinforced so as to qualify as reinforced masonry or concrete under the provisions of Divisions 24 and 28. Principal reinforcement in masonry shall be spaced four feet maximum on center except that a maximum spacing of two feet on center shall be used in buildings utilizing a ductile moment resisting space frame.

4. Combined Vertical and Horizontal Forces. In computing the effect of seismic force in combination with vertical loads, gravity load stresses induced in members by dead load plus

design live load, except roof live load, shall be considered. Consideration should also be given to minimum gravity loads acting in combination with lateral forces.

5. **Diaphragms.** Floor and roof diaphragms shall be designed to resist the forces specified in Table No. 23-B. Diaphragms which laterally support concrete or masonry walls shall have continuous ties between diaphragm chords to distribute the wall anchorage forces specified in Subsection 91.2306(b) into the diaphragm. Additional chords may be used to form sub-diaphragms to transmit the wall anchorage forces to the continuous ties. Diaphragm deformations shall be considered in the design of the supported walls.

6. **Exterior Elements.** Precast, non-bearing, non shear wall panels or other elements which are attached to, or enclose the exterior, shall accommodate movements of the structure resulting from lateral forces or temperature changes. The concrete panels or other elements shall be supported by means of poured-in-place concrete or by mechanical fasteners in accordance with the following provisions:

A. Connections and panel joints shall allow for a relative movement between stories of not less than two times story drift caused by wind or 3.0 divided by the numerical coefficient, K, times story drift caused by the required seismic force specified in Subsection 91.2305(d) 2B or $\frac{1}{4}$ -inch, whichever is greater.

B. Connections shall have sufficient ductility and rotation capacity so as to preclude fracture of the concrete or brittle failures at or near welds. Inserts in concrete shall be attached to, or hooked around reinforcing steel, or otherwise terminated so as to effectively transfer forces to the reinforcing steel.

C. Connections to permit movement in the plane of the panel for story drift may be properly designed sliding connections using slotted or oversize holes or may be connections which permit movement by bending of steel.

7. **Pile Caps and Caissons.** Individual pile caps and caissons of every building or structure shall be interconnected by ties, each of which can carry by tension and compression a minimum horizontal force equal to 10 percent of the larger column loading, unless it can be demonstrated that equivalent restraint can be provided by other approved methods.

8. **Lateral Force on Elements of Structures.** Parts or portions of structures and their anchorage shall be designed for lateral forces in accordance with Section 91.2305(d) but not less than the following equation:

$$F_p = I C_p S W_p \quad (23-8)$$

The values of C_p are set forth in Table 23-B. Where C_p is 1.0 or more the values of I and S need not exceed 1.0. The value of the product $I C_p S$ shall be not less than 0.50 for equipment required to remain in place and be functional in essential facilities. The distribution of these forces shall be according to the gravity loads pertaining thereto.

(1) **Building Separations.** All portions of structures shall be designed and constructed to act as an integral unit in resisting horizontal forces unless separated structurally by a distance sufficient to avoid contact under deflection from seismic action or wind forces.

(m) > **Elevated Tanks and Storage Racks.**

1. **Elevated Tanks.**

A. Designs for elevated tanks on four or more cross-braced columns and not supported by a building shall conform to the following:

The period "T" shall be substantiated by technical data. The value of "KC" as used in $V = IKCSW$ in this Subdivision shall not be less than 0.12 but need not exceed 0.25.

Resistance to horizontal torsion shall be provided and the

torsional eccentricity shall be not less than five percent as provided in this section for buildings.

B. Designs for elevated tanks having arrangements of columns other than in Paragraph A of this Subdivision shall use a value of "KC" equal to not less than 0.20 and other provisions of Paragraph A of this Subdivision shall apply.

2. Storage Racks. Storage racks over 8 feet 3 inches in height measured to the level of the top shelf shall be designed using one of the following methods:

A. Storage racks may be designed to resist the lateral forces in accordance with the following equation:

$$F_p = IC_p SW_p$$

The values of C_p are as set forth in Table 23-B.

B. Storage racks which are not laterally braced to buildings or other structures may be considered a "building" and be designed in accordance with the provisions of Section 91.2305(d)2, except that W in the formula $V = IKCSW$ shall be equal to the weight of the rack structure plus the posted rack capacity.

EXCEPTION: Such storage racks which are interconnected so that there are a minimum of four vertical elements in each direction on each column line to resist lateral forces may be designed assuming W is equal to the weight of the rack structure plus 50 percent of the posted rack capacity. The product C times S in the formula $V = IKCSW$ shall be equal to 0.20.

(n) Wind Pressure. 1. General. Buildings, structures or portions thereof shall be designed to withstand the minimum horizontal and uplift pressures set forth in Table No. 23-M and this Sub-section, allowing for wind from any direction. The wind pressures set forth in Table No. 23-M are minimum values for normal exposures within the area of the City of Los Angeles.

EXCEPTION: The design of specific buildings exceeding 160 feet in height may be based on special wind studies, provided any such study is submitted by the engineer responsible for the structural design of the building and is accepted by the Superintendent of Building.

2. Horizontal Wind Pressure. The horizontal wind pressure shall be assumed to act upon the gross area of the vertical projection of the building or structure above the adjacent ground.

EXCEPTION: Roof shelters over fueling areas of motor vehicle service stations shall have the wind pressure computed upon $1\frac{1}{2}$ times the area of only those surfaces exposed to the wind.

3. Uplift Wind Pressure. Roofs of all enclosed structures shall be designed to withstand uplift wind pressures acting normal to the roof surfaces equal to three-fourths of the values set forth in Table No. 23-M. An enclosed structure shall be defined as a structure enclosed at the perimeter with exterior walls. Opening are permitted in the exterior walls, provided they are glazed or protected with door assemblies.

Roofs of buildings, roof overhangs, architectural projection eaves, canopies, cornices, marquees, or similar structures which are unenclosed on one or more sides shall be designed to withstand uplift wind pressures equal to $1\frac{1}{4}$ times the values set forth in Table No. 23-M.

The uplift wind pressure shall be assumed to act over the entire roof area and to act concurrently with the horizontal wind pressure.

4. Sloping Roofs. Roofs or section of roofs with slopes greater than 30 degrees shall be designed to withstand the pressure as set forth in Table No. 23-M, acting inwardly normal to the surface and applied to the windward slope only.

5. Anchorage. Anchorage of the roof to walls and columns, and of walls and columns to the foundations, shall be provided to resist overturning, uplift and sliding.

6. Solid Towers. Wind pressure on chimneys, tanks and solid

towers may be modified by the shape factors set forth in Table No. 23-N.

7. **Open Frame Towers.** Wind pressure shall be applied to the normal projected area of all the elements of one face of the tower. Ladders, conduits, lights, elevators, and similar elements shall be accounted for separately by using the indicated factor for these individual members.

The wind pressure shall be modified by the shape factors set forth in Table No. 23-O.

8. **Miscellaneous Structures.** Greenhouses, lath houses, agricultural buildings and residential patio covers shall be designed for the horizontal wind pressure as set forth in Table No. 23-M, except that, if the height of the structure is 10 feet or less, a pressure of 10 pounds per square foot may be used. The structure shall be designed to withstand an uplift wind pressure equal to three-fourths of the horizontal pressure.

EXCEPTION: Patio covers accessory to a Group R or H Occupancy and not located in Fire District No. 1 or 2 may be designed and constructed in accordance with Section 91.4825.

9. **Moment of Stability.** The overturning moment calculated from the wind pressure shall not exceed two-thirds of the dead load resisting moment.

The weight of earth superimposed over footings may be used to calculate the dead load resisting moment.

10. **Combined Wind and Live Loads.** For the purpose of determining stresses all vertical design loads except the roof live load and crane loads shall be considered as acting simultaneously with the wind pressure.

TABLE NO. 23-M — WIND PRESSURES FOR VARIOUS HEIGHTS ABOVE ADJACENT GROUND ELEVATION⁽¹⁾

HEIGHT (Feet)	WIND PRESSURE (Pounds Per Square Foot)
Less than 60	15
60 to less than 160	20
160 to less than 500	25
500 and higher	30

NOTE: (1) For sloping ground the average elevation shall be used.

TABLE NO. 23-N — SHAPE FACTORS FOR WIND PRESSURES — CHIMNEYS, TANKS, AND SOLID TOWERS

TRANSVERSE CROSS SECTION	FACTOR
Square or rectangular	1.00
Hexagonal or octagonal	0.80
Round or elliptical	0.60

TABLE NO. 23-O — SHAPE FACTORS FOR WIND PRESSURES — OPEN FRAME TOWERS

TYPE OF EXPOSURE	FACTOR
Wind normal to one face of tower ⁽¹⁾	
Four-cornered, flat or angular sections, steel or wood	2.20
Three-cornered, flat or angular sections, steel or wood	2.00
Wind on corner, four-cornered tower, flat or angular sections ⁽¹⁾	2.40
Wind parallel to one face of three-cornered tower, flat or angular sections ⁽¹⁾	1.50
Factors for towers with cylindrical elements are approximately two-thirds of those for similar towers with flat or angular sections.	
Wind on individual members	
Cylindrical members	
Two inches or less in diameter	1.00
More than two inches in diameter	0.80
Flat or angular sections	1.30

NOTE: (1) The one-third increase in allowable stress permitted by 91.2301 (g) of the Code shall not be used in these structural designs controlled by wind only.

(o) **High Wind Velocity Areas.** The Superintendent of Building may designate by Rule of General Application certain areas of the City as "High Wind Velocity Areas" when evidence or studies indicate that the wind velocity results in damage to structures conforming to the minimum requirements of the Code. The Superintendent may specify in the Rule additional requirements over and above those required by the Code with respect to the following:

1. Glazing of openings in exterior walls.
2. Anchorage of post and beam construction.
3. Cantilever Overhangs.
4. Roofing and roof framing.

SEC. 91.2306 — DESIGN FOR HORIZONTAL FORCE

(a) **Truss Bracing.** Roof trusses shall be cross braced in a vertical plane normal to the plane of the trusses.

Cross bracing shall be installed at intervals not greater than 30 feet measured in a direction parallel to the trusses.

Cross bracing shall be installed in every fourth bay between trusses. Continuous struts shall be installed between panels of cross bracing in the plane of the lower chord of the trusses.

Struts and cross bracing shall be designed to withstand a horizontal force equal to 10% of the stress in the lower chord of the roof truss.

EXCEPTION: *This Subsection shall not apply to exposed trusses in public assembly rooms.*

(b) **Anchorage of Concrete or Masonry Walls.** Concrete or masonry walls shall be anchored to all floors and roofs which provide lateral support for the wall. The anchorage shall provide a positive direct connection between the walls and floor or roof construction capable of resisting the horizontal forces specified in this Division or a minimum force of 200 pounds per lineal foot of wall, whichever is greater. Walls shall be designed to resist bending between anchors where the anchor spacing exceeds four feet. In walls of hollow unit construction, anchors shall be embedded in reinforced grouted structural elements of the wall.

EXCEPTION: *When walls are anchored to continuous footings, anchorage to floors that are within four feet of footings may be omitted.*

(c) **Rod Bracing Systems.** Rod bracing systems used for the purpose of transferring horizontal forces in buildings or structures with masonry or concrete walls shall be adjustable.

All adjustable rod bracing systems shall conform to the requirements of Section 91.2702(b) 10 and shall be maintained as set forth in Section 91.0103 of this Article.

(d) **Shear in Concrete Frames.** All concrete frames subjected to reversals of stresses resulting from wind or seismic forces, and not designed as a ductile moment-resisting space frame under Division 28 of this Code shall be provided with sufficient closed loop stirrups to resist all shearing forces with no allowable shear given for the concrete. This requirement shall not apply to column strips in flat slabs or flat plate floor systems.

(e) **Earthquake Recording Instrumentation.** 1. General. Every building over six stories in height with an aggregate floor area of 60,000 square feet or more, and every building over 10 stories in height, regardless of the floor area, shall be provided with three approved recording accelerographs. The owner of the build-

ing shall provide replacement batteries and any other material necessary to maintain the instrument in proper working condition.

2. Location and Access. The instruments shall be located in the basement, mid-portion and near the top of the building. Each instrument shall be located so that access is maintained at all times unobstructed by room contents.

A sign stating "MAINTAIN CLEAR ACCESS TO THIS INSTRUMENT" in one-inch block letters shall be posted in a conspicuous location at the instrument.

3. Non-Retroactive. The requirements of this Subsection shall not apply to existing buildings, but shall only apply to buildings, the permits for which are issued after July 1, 1965.

SEE RULES OF GENERAL APPLICATION #1-67 AND #33-69 IN APPENDIX SECTION

SEC. 91.2307 — SPECIAL LOADINGS

(a) **Guard Rails.** Guard rails protecting areas used for public assembly shall be designed to withstand a horizontal force of 50 pounds per linear foot applied at the top of the railing. All other required guard rails shall be designed to withstand a horizontal force of 20 pounds per linear foot applied at the top of the railing. All guard rails shall be designed to withstand a vertical downward force of 20 pounds per linear foot. This force is not additive to other required floor and roof loads.

(b) **Marquees.** The members and connections attaching a marquee to the structural frame of the supporting building shall be designed to support twice the dead load of the marquee plus the required live loads.

(c) **Crane Supports.** Structural members supporting cranes or other moving equipment shall be designed to withstand a lateral load equal to 20% of the sum of the weights of the lifted load and of the crane trolley, but exclusive of other parts of the crane except when computing earthquake effect, applied at the top of rail $\frac{1}{2}$ on each side of runway; and shall be considered as acting in either direction normal to the runway rail. The longitudinal force shall be taken as 10% of the maximum wheel loads of the crane applied at the top of rail.

(d) **Grandstands, Stadiums, Bleachers and Reviewing Stands.** In addition to other design requirements of this Division, grandstands, stadiums, bleachers, assembly platforms and reviewing stands shall be designed to resist a horizontal force applied to seats of 24 pounds per linear foot parallel to seats and 10 pounds per linear foot perpendicular to seats. Platforms without seats shall be designed to resist a minimum horizontal force of five pounds per square foot of horizontal projection.

(e) **Heliport and Helistop Landing Areas.** In addition to other design requirements of this Division, heliport and helistop landing or touch down areas shall be designed for the maximum stress induced by:

1. Dead load plus actual weight of the helicopter;

2. Dead load plus a single concentrated impact load covering one square foot of .75 times the fully loaded weight of the helicopter if it is equipped with hydraulic type shock absorbers, or 1.5 times the fully loaded weight of the helicopter if it is equipped with a rigid or skid type landing gear;

3. The dead load plus a uniform live load of 100 pounds per square foot. The required live load may be reduced in accordance with the formula in Section 91.2303 of the Los Angeles Municipal Code.

(f) **Gridirons and Fly Galleries.** Gridirons and fly galleries shall be designed to support not less than 75 pounds live load per square foot.

Each loft block well shall be designed to support 250 pounds per lineal foot and the head block well shall be designed to support the aggregate weight of all the loft block wells served. The head block well must be provided with an adequate strongback or lateral brace to offset torque.

The main counterweight sheave beam shall be designed to support a horizontal and vertical uniformly distributed live load sufficient to accommodate the weight imposed by the total number of loft blocks in the gridiron. The sheave blocks shall be designed to accommodate the maximum load for the loft blocks or head blocks served with a safety factor of five.

(g) **Impact.** For structures carrying live loads which induce impact, the assumed live load shall be increased by not less than the following:

For elevator supports	100 percent
For traveling crane support girders and their connections	25 percent
For supports of light machinery, shaft or motor driven	20 percent
For supports of reciprocating machinery or power driven units	50 percent
For hangers supporting floors and balconies	33 percent

SEC. 91.2303 — LIMITATION ON USE OF WOOD MEMBERS

(a) **Dead Load.** No wood member shall be used to support the dead load of any masonry or concrete.

EXCEPTIONS: 1. Masonry or concrete nonstructural floor surfacing which is not more than four inches thick may be supported by wood members.

2. Any structure may rest upon wood piles, if constructed according to the requirements of Division 28.

(b) **Horizontal Forces.** No wood member shall be used to resist the horizontal forces contributed by any concrete or masonry construction.

EXCEPTION: Wood floor and roof members may be used in horizontal trusses and diaphragms that resist horizontal forces, provided such resistance does not involve rotational action of the truss or diaphragm. This shall not be deemed to allow the supporting or staying of masonry or concrete basement walls or retaining walls.

SEC. 91.2309 — RETAINING WALLS

(a) **Design.** Retaining walls shall be designed to resist the lateral pressure of the retained material determined in accordance with accepted engineering principles.

The soil characteristics and design criteria necessary for such a determination shall be obtained from a special foundation investigation performed by an agency acceptable to the Department. The Department shall approve such characteristics and criteria only after receiving a written opinion from the investigation agency together with substantiating evidence.

EXCEPTION: Freestanding walls which are not over 15' in height or basement walls which have spans of 15' or less between supports may be designed in accordance with Subsection (b) of this Section.

TABLE NO. 23-E

Surface Slope of Retained Material* Horiz. to Vert.	Equivalent Fluid Weight lb/ft ³
LEVEL	30
5 to 1	32
4 to 1	35
3 to 1	38
2 to 1	43
1½ to 1	55
1 to 1	80

* Where the surface slope of the retained earth varies, the design slope shall be obtained by connecting a line from the top of the wall to the highest point on the slope, whose limits are within the horizontal distance from the stem equal to the stem height of the wall.

(b) **Arbitrary Design Method.** Walls which retain drained earth and come within the limits of the exception to Subsection (a) of this section may be designed for an assumed earth pressure equivalent to that exerted by a fluid weighing not less than shown in Table 23-E. A vertical component equal to one-third of the horizontal force so obtained may be assumed at the plane of application of the force.

The depth of the retained earth shall be the vertical distance below the ground surface measured at the wall face for stem design or measured at the heel of the footing for overturning and sliding.

(c) **Surcharge.** Any superimposed loading, except retained earth, shall be considered as surcharge and provided for in the design. Uniformly distributed loads may be considered as equivalent added depth of retained earth. Surcharge loading due to continuous or isolated footings shall be determined by the following formulas or by an equivalent method approved by the Superintendent of Building.

Resultant Lateral Force

$$R = \frac{0.3 Ph^2}{x^2 + h^2}$$

Location of Lateral Resultant

$$d = x \left[\left(\frac{x^2}{h^2} + 1 \right) \left(\tan^{-1} \frac{h}{x} \right) - \left(\frac{x}{h} \right) \right]$$

Where:

R = Resultant lateral force measured in pounds per foot of wall width.

P = Resultant surcharge load of continuous or isolated footings measured in pounds per foot of length parallel to the wall.

x = Distance of resultant load from back face of wall measured in feet.

h = Depth below point of application of surcharge loading to top of wall footing measured in feet.

d = Depth of lateral resultant below point of application of surcharge loading measured in feet.

$$\left(\tan^{-1} \frac{h}{x} \right) = \text{The angle in radians whose tangent is equal to } \left(\frac{h}{x} \right).$$

Loads applied within a horizontal distance equal to the wall stem height, measured from the back face of the wall, shall be considered as surcharge.

For isolated footings having a width parallel to the wall less than three feet, "R" may be reduced to $1/6$ the calculated value.

The resultant lateral force "R" shall be assumed to be uniform for the length of footing parallel to the wall, and to diminish uniformly to zero at the distance "x" beyond the ends of the footing.

Vertical pressure due to surcharge applied to the top of the wall footing may be considered to spread uniformly within the limits of the stem and planes making an angle of 45° with the vertical.

(d) **Bearing Pressure and Overturning.** The maximum vertical bearing pressure under any retaining wall shall not exceed that allowed in Division 28 of this Article except as provided for by a special foundation investigation. The resultant of vertical loads and lateral pressures shall pass through the middle one-third of the base.

(e) **Friction and Lateral Soil Pressures.** Retaining walls shall be restrained against sliding by friction of the base against the earth, by lateral resistance of the soil, or by a combination of the two. Allowable friction and lateral soil values shall not exceed those allowed in Division 28 of this Article except as provided by a special foundation investigation.

When used, keys shall be assumed to lower the plane of frictional resistance and the depth of lateral bearing to the level of the bottom of the key. Lateral bearing pressures shall be assumed to act on a vertical plane located at the toe of the footing.

(f) **Construction.** No retaining wall shall be constructed of wood.

(g) **Special Conditions.** Whenever, in the opinion of the Superintendent of Building, the adequacy of the foundation material to support a wall is questionable, an unusual surcharge condition exists, or whenever the retained earth is so stratified or of such a character as to invalidate normal design assumptions, he may require a special foundation investigation before approving any permit for such a wall.

SEC. 91.2310 — TRUSSES, ARCHES AND GIRDERS

Trusses, arches, and girders having a span greater than 40 feet, and supported by masonry or concrete columns or walls shall have a length of bearing, measured parallel to the span, of not less than eight inches.

EXCEPTION: Lesser bearing lengths will be permitted when the trusses, arches, or girders are fabricated using actual measured distances between bearings, or when other approved procedures are used which will assure bearing centered upon the line used in the design calculations.

SEC. 91.2311 — POLES

(a) **Design.** Flag poles, sign poles, columns or other poles cantilevering from and receiving lateral stability from the ground shall have their lateral support designed in accordance with the following formulas or other methods approved by the Superintendent of Building. Bearing stresses so obtained shall not exceed the values permitted by Section 91.2803 (d).

CASE I — POLES WITH LATERAL RESTRAINT AT THE GROUND SURFACE

$$f = \frac{3.8M}{bd^2}$$

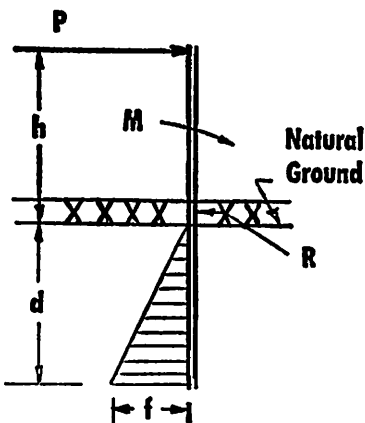
Where:

f = lateral soil pressure in lbs/sq. ft.

M = moment at natural ground surface resulting from applied loads in ft. pounds.

b = diameter of round pole or 1.27 times width of rectangular pole, measured in feet.

R = Reaction capable of taking resultant loads.



CASE II — POLES WITHOUT LATERAL RESTRAINT AT THE GROUND SURFACE

$$f_1 = \frac{2.85 P}{bd} + \frac{f_2}{4}$$

$$f_2 = \frac{7.62 P (2h + d)}{bd^2}$$

Where:

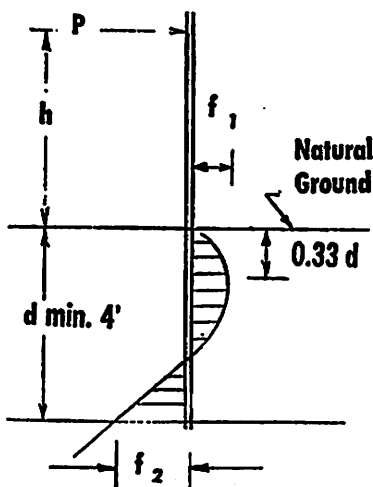
f_1 and f_2 = lateral soil pressure in lbs/sq. ft.

b = diameter of round pole or 1.27 times width of rectangular pole, measured in feet.

d = depth of embedment below natural ground in feet (minimum four feet).

h = height of applied lateral load above natural ground measured in feet.

P = lateral force in pounds.



DIVISION 24 — MASONRY

SEC. 91.2401 — SCOPE

All masonry within the jurisdiction of the Department shall conform to the regulations of this Division and shall be limited to the materials specified in this Division.

EXCEPTION: Walls and partitions of one-story Group H and R Occupancy buildings and buildings accessory thereto may be constructed under the provisions of Division 48.

SEC. 91.2402 — DEFINITIONS

For the purpose of this Chapter certain terms are defined as follows:

Dimensions. Dimensions given are nominal; actual dimensions of unit masonry may not be decreased by more than $\frac{1}{2}$ inch.

Gross Cross-Sectional Area of Hollow Units. The total area including cells of a section perpendicular to the direction of loading. Re-entrant spaces are included in the gross area, unless these spaces are to be occupied in masonry by portions of adjacent units.

Masonry Unit. Any brick, tile, stone, or block conforming to the requirements specified in Section 91.2403.

SEC. 91.2403 — QUALITY AND DESIGN OF MASONRY MATERIALS

(a) General. 1. Every masonry unit shall have all surfaces, to which mortar or grout is to be applied, capable of developing the masonry strengths required in this Chapter.

2. Materials shall conform to the following standards:

MATERIAL DESIGNATIONS OR SPECIFICATIONS (MASONRY)

Materials	Standards	Designation
Building Brick		
Clay or Shale	A.S.T.M. Designation	C62
Clay, Shale or Fireclay.....	A.S.T.M. Designation	C216
Sand-Lime.....	A.S.T.M. Designation	C73
Concrete.....	A.S.T.M. Designation	C55
Sampling and Testing of.....	A.S.T.M. Designation	C67
Concrete Masonry Units		
Hollow Load-Bearing.....	A.S.T.M. Designation	C90
Solid Load-Bearing.....	A.S.T.M. Designation	C145
Hollow Non-Load-Bearing.....	A.S.T.M. Designation	C129
Structural Clay Tile		
For Walls—Load-Bearing.....	A.S.T.M. Designation	C34
For Walls—Nonbearing.....	A.S.T.M. Designation	C56
For Floors.....	A.S.T.M. Designation	C57
Gypsum		
General.....	A.S.T.M. Designation	C22
Partition Tile or Block.....	A.S.T.M. Designation	C52
Reinforced.....	A.S.A. Designation	A59.1
Lime		
Quicklime.....	A.S.T.M. Designation	C5
Hydraulic Hydrated Lime for Structural Purposes.....	A.S.T.M. Designation	C141
Hydrated Lime for Masonry Purposes.....	A.S.T.M. Designation	C207
Special Finishing Hydrated Lime.....	A.S.T.M. Designation	C206
Cement		
Portland Cement.....	A.S.T.M. Designation	C150
Masonry Cement—Excerpts from Federal Specification SS-C181 b of the United States Federal Government.		
Air-Entraining Portland Cement	A.S.T.M. Designation	C175
Aggregate for Masonry Mortar.....	A.S.T.M. Designation	C144
Cast Stone.....	A.C.I. Designation	704

(b) **Brick Made from Clay or Shale.** Building brick of clay or shale shall be of a quality at least equal to that required by ASTM Designation C62 or C216. When in contact with the ground, brick shall be of at least Grade MW. Where severe frost action occurs in the presence of moisture, brick shall be at least Grade SW.

(c) **Brick Made from Sand-Lime.** Building brick made from sand-lime shall be of a quality at least equal to that required by ASTM Designation C73. When in contact with the ground, brick shall be of at least Grade MW. Where severe frost action occurs in the presence of moisture, brick shall be at least Grade SW.

(d) **Concrete Brick.** Building brick of concrete shall be of a quality at least equal to that required by ASTM Designation C55.

(e) **Structural Clay Tile.** Structural clay tile shall be of a quality at least to equal that required by ASTM Designation C34 Grade LB when used for bearing walls or piers, or Grade LEX when exposed to the weather or soil; or equal to ASTM Designation C56, when used for interior non-bearing purposes; or equal to ASTM Designation C57, when used for floor construction.

(f) **Concrete Masonry Units.** Concrete masonry units shall be of a quality at least equal to that required by ASTM Designation C90 or C145, grades N when used for bearing walls or piers, or when in contact with ground or exposed to the weather; or equal to ASTM Designation C129, when used for non-bearing purposes and not exposed to the weather.

(g) **Gypsum Units.** Gypsum partition tile or block shall be of a quality at least equal to that required by ASTM Designation C52.

(h) **Cast Building Stones.** Cast building stone shall conform to A.C.I. Designation 704. Every concrete unit more than 18 inches in any direction shall conform to the requirements for concrete in Division 26.

(i) **Unburned Clay Bricks.** Unburned clay brick shall conform to the requirements specified in Section 91.2405.

(j) **Stone.** Natural stone shall be sound, clean, and in conformity with other provisions of this Chapter.

(k) **Structural Glass Block.** Structural glass block shall have unglazed surfaces to allow adhesion on all mortared faces.

(l) **Glazed Building Units.** Glazed brick shall conform to the structural requirements for building brick of clay or shale, and glazed structural tile shall conform to the structural requirements for structural clay tile.

(m) **Reinforcing Steel.** Reinforcing steel shall conform to the physical and chemical requirements for metal reinforcement in concrete, as specified in Division 26 of this Code.

(n) **Water.** Water used in mortar, grout, or masonry work shall be clean and free from injurious amounts of oil, acid, alkali, organic matter, or other harmful substances.

(o) **Cement.** Cement for mortar shall be Types I, II, or III portland cement as specified in ASTM Designation C150; Types I-A, II-A, or III-A air-entraining portland cement as specified in ASTM Designation C175 with an approved air-entraining addition; or masonry cement as specified in ASTM Designation C-91.

EXCEPTIONS: 1. *Approved types of plasticizing agents may be added to portland cement Types I or II in the manu-*

facturing process, but not in excess of 12% of the total volume. Plastic or waterproofed cements so manufactured shall meet the requirements for portland cement as specified in ASTM Designation C150, except in respect to the limitations on insoluble residue, air-entrainment and additions subsequent to calcination.

2. Cement for grout shall be Type I, II, or III portland cement as specified in ASTM Designation C150.

(p) Lime. Quicklime shall conform to ASTM Designation C5. Hydrated lime shall conform to the requirements of ASTM Designation C207. Lime putty shall be made from quicklime or hydrated lime.

If made from quicklime, the lime shall be slaked and then screened through a No. 16 mesh sieve. After slaking, screening, and before using, it shall be stored and protected for not less than 10 days. The resulting lime putty shall weigh not less than 83 pounds per cubic foot.

(q) Mortar. 1. General. Mortar other than gypsum mortar used in masonry construction shall be classified in accordance with (a) the materials and proportions set forth in Table No. 24-A, or (b) the properties as established by laboratory tests as set forth in ASTM C270. Tests made to classify mortar by compressive strength shall be as set forth in ASTM C270, using the proportions and materials proposed for use. Aggregates for mortar shall conform to the provisions set forth in ASTM C144.

2. Strength. The strength of mortar using cementitious materials set forth in Table No. 24-A shall meet the minimum compressive strength shown. The Department may require field tests to verify compliance with this Section. Such tests shall be made in accordance with the following: Spread mortar on the masonry units $\frac{1}{2}$ -inch thick to $\frac{5}{8}$ -inch thick, and allow to stand for one minute, then remove mortar and place in a two-inch by four-inch cylinder in two layers, compressing the mortar into the cylinder using a flat end stick or fingers. Lightly tap molds on opposite sides, level off and immediately cover molds and keep them damp until taken to the laboratory. After 48 hours set, have the laboratory remove molds and place in the fog room until tested in the damp condition.

(r) Grout. 1. General. Grout shall be proportioned by volume and shall have sufficient water added to produce consistency for pouring without segregation. Aggregate shall conform to the requirements set forth in ASTM Designation C404.

2. Type. Fine grout shall be composed of one part portland cement, to which may be added not more than one-tenth part hydrated lime or lime putty, and two and one-fourth to three parts sand.

Coarse grout shall be composed of one part portland cement to which may be added not more than one-tenth part hydrated lime or lime putty, and two to three parts sand, and not more than two parts gravel.

Coarse grout may be used in grout spaces in brick masonry two inches or more in horizontal dimension and in grout spaces in filled-cell construction four inches or more in both horizontal dimensions.

3. Strength. Grout shall attain a minimum compressive strength of 2000 pounds per square inch at 28 days. The Department may require a compressive field strength test of grout prisms, which are to be made in accordance with the following: On a flat nonabsorbent base, form a space approximately three inches by three inches by six inches high, i.e., twice as high as it is wide, using masonry units having the same moisture condition as those being laid. Line the space with a permeable paper or

porous separator so that water may pass through the liner into the masonry units. Thoroughly mix or agitate grout to obtain a fully representative mix and place into molds in two layers, and puddle each layer with a one-inch by two-inch puddling stick to eliminate air bubbles. Level off and immediately cover molds and keep them damp until taken to the laboratory. After 48 hours set, have the laboratory carefully remove masonry units and place specimens in the fog room until tested in the damp condition.

(s) **Mortar Limitations.** Masonry units used in foundation walls and footings shall be laid up in Type S or Type M mortar. Type N mortar shall be used only in interior nonstructural walls.

(t) **Aggregates.** Aggregates for mortar shall be of a quality at least equal to that specified in ASTM Designation C144.

(u) **Rate of Absorption.** At the time of laying, burned clay units and sand-lime units shall have a rate of absorption not exceeding 0.025 ounces per square inch during a period of one minute. In the absorption test the surface of the unit shall be held $\frac{1}{4}$ inch below the surface of the water.

(v) **Re-Use of Masonry Units.** Masonry units may be re-used when cleaned, whole, and conforming to the other requirements of this Division appropriate to the type of unit.

(w) **Gypsum.** Gypsum shall conform to ASTM Designation C22.

(x) **Admixtures.** 1. General. An approved admixture may be used in mortar or grout but only in an approved proportion. Compatible admixtures may be used in combination in a mix when approved for use in such combination but only in approved proportions.

Prior to the use of any admixture in any mortar or grout the chemical composition and brand name of the admixture shall be certified to the Superintendent of Building by the person responsible for its use.

EXCEPTION: Certification need not be made when the admixture is delivered to the site in sealed containers bearing the name of the manufacturer and the brand name.

2. Approval. To secure approval by the Department for use in mortar or grout, every admixture shall conform to the following regulations:

A. A certified statement of the chemical composition shall be filed in the office of the Superintendent of Building.

TABLE NO. 24-A — MORTAR PROPORTIONS
(Parts by Volume)

Mortar Type	Minimum Compressive Strength At 28 Days (p.s.i.)	Portland Cement	Hydrated Limes or Lime Putty ⁽¹⁾		Masonry Cements	Damp Loose Aggregate
			Min.	Max.		
M	2500	1	—	$\frac{1}{4}$	—	Not less than $2\frac{1}{4}$ and not more than 3 times the sum of the volumes of the cement and lime used.
		1	—	—	1	
S	1800	1	$\frac{1}{4}$	$\frac{1}{2}$	—	
		$\frac{1}{2}$	—	—	1	
N	750	1	$\frac{1}{2}$	$1\frac{1}{4}$	—	
		—	—	—	1	

NOTE: ⁽¹⁾ When plastic or waterproof cement is used as specified in Section 91.2403(o), hydrated lime or putty may be added, but not in excess of one-tenth the volume of cement.

B. No admixture shall contain deleterious amounts of any substance.

C. Tests of mortar shall consist of compression tests and such other tests as required by the Superintendent of Building. Compression tests shall be made on two-inch cubes and as required by Section 91.2403(q). Tests of grout shall be made on cylinders and as required by Section 91.2615(b). Tests shall be made on at least three samples containing admixture and on at least three samples containing no admixture. Tests on mortar or grout containing the approved proportion of admixture shall show not more than five percent less strength at 28 days than tests on identical samples containing no admixture.

D. Tests on mortar or grout containing the approved proportion of admixture shall be made at the ages of 28 days, one year, and two years. No test shall show a strength less than the strength shown by any prior test. Tests shall be made on at least three samples at each age.

(y) **Masonry Unit Surfaces.** Every masonry unit shall have all surfaces, to which mortar or grout is to be applied, capable of developing the masonry strengths required in this Division.

SEC. 91.2404 — TESTS

(a) **General.** Whenever there is any evidence that any material to be used in masonry construction does not conform to the provisions of this Division, the material shall be proved by test to be in conformity before being used in the work. All tests shall be made by an approved testing agency in accordance with the requirements specified in this Section.

If the member or portion of the structure under construction fails to pass the tests, the permittee shall make such changes or modifications as are necessary to provide the strength required by this Code.

All testing and replacement shall be done without expense to the City.

(b) **Load Tests.** When a load test is required, the member or portion of the structure under consideration shall be subject to a superimposed load equal to twice the design live load plus one-half of the dead load. This load shall be left in position for a period of 24 hours before removal. If, during the test or upon removal of the load, the member or portion of the structure shows evidence of failure, such changes or modifications as are necessary to make the structure adequate for the rated capacity shall be made; or where lawful, a lower rating shall be established. A flexural member shall be considered to have passed the test if the maximum deflection "D" at the end of the 24-hour period neither exceeds

$$D = \frac{L}{200} \quad \text{nor } D = \frac{L^2}{4000t}$$

and the beams and slabs show a recovery of at least 75 per cent of the observed deflection within 24 hours after removal of the load.

WHERE:

L = span of the member in feet.

t = thickness or depth of the member in feet.

(c) **Determination of Masonry Design Strength.**

1. **General.** The value of f'_m shall be determined by tests of masonry assemblies in accordance with the provisions of para-

graph 2 of this Subsection or shall be assumed in accordance with the provisions of paragraph 3 of this Subsection.

2. Tests.

A. General. When the strength f'_m is to be established by tests, they shall be made using prisms built of the same materials, under the same conditions and, insofar as possible, with the same bonding arrangements as for the structure. The moisture content of the units at time of laying, consistency of mortar, and workmanship shall be the same as will be used in the structure. The value of f'_m shall be the average of all specimens tested but shall be not more than 125 per cent of the minimum value determined by test.

Testing shall include tests in advance of beginning operations and at least one field test during construction for each 5000 square feet of wall but not less than three such tests for any building.

The compressive strength f'_m shall be computed by dividing the ultimate load by the net area of the masonry used in the construction of the prisms. The gross area may be used in the determination of f'_m for solid masonry units as defined in ASTM Designation C 62.

B. Prisms. Prisms shall be not less than 12 inches high and shall have a height-to-thickness minimum dimension ratio of not less than 1.5 nor more than 5. Hollow masonry unit prisms shall be not less than one masonry unit in length and solid masonry unit prisms or solid filled prisms shall be not less than 4 inches in length. The thickness and type of construction shall be representative of the masonry element under consideration. Cores in hollow masonry shall not be filled, except for solid filled construction.

The strength " f'_m " shall be taken as the compressive strength of the specimens multiplied by the following correction factor:

Ratio of h/d	1.5	2.0	3.0	4.0	5.0
Correction factor	0.86	1.0	1.2	1.3	1.37

WHERE:

h = height of specimen in inches.

d = minimum dimension of specimen in inches.

Intermediate values may be interpolated.

C. Storage of Test Prisms. Test prisms shall be stored for seven days in air, at a temperature of 70 degrees, plus or minus five degrees, in a relative humidity exceeding 90 percent, and then in air at a temperature of 70 degrees, plus or minus five degrees, at a relative humidity of 30 percent to 50 percent until tested. Prisms constructed in the field shall be stored undisturbed in the field for 48 to 96 hours under wet material to simulate 90 percent humidity, then transported to a laboratory for continued curing as specified above. Prisms shall be capped and tested in compression similar to tests for molded concrete cylinders as specified in ASTM C57.

D. Sampling. Not less than five specimens shall be made for each initial preliminary test to establish f'_m . Not less than three shall be made for each field test to confirm that the materials are as assumed in the design. The standard age of test specimens shall be 28 days, but seven-day tests may be used, provided the relation between the seven-day and 28-day strengths of the masonry is established by adequate test data for the materials used.

3. Assumed Ultimate Compressive Strength. When prism tests are not made as in paragraph 2 of this Subsection f'_m may be assumed as:

Solid Clay Units — 14,000 psi gross	$f'_m = 5300$
Solid Clay Units — 10,000 psi gross	$f'_m = 4000$
Solid Clay Units — 6,000 psi gross	$f'_m = 2600$
Solid Units — 3,000 psi gross	$f'_m = 1800$
Solid Units — 2,500 psi gross	$f'_m = 1500$
Hollow Concrete Units — Grade N	$f'_m = 1350$
Hollow Concrete Units — Grade N grouted solid	$f'_m = 1500$
Hollow Clay Units — Grade LB ($1\frac{1}{4}$ " minimum face shell)	$f'_m = 1350$
Hollow Clay Units — Grade LB ($1\frac{1}{4}$ " minimum face shell) grouted solid	$f'_m = 1500$

Where the assumed f'_m exceeds 2600 pounds per square inch, field tests in accordance with Section 91.2404(c)2 shall be required.

SEC. 91.2405 — UNBURNED CLAY MASONRY

(a) **General.** Masonry of unburned clay units shall not be used in any building more than one story in height. The unsupported height of every wall of unburned clay units shall be not more than 10 times the thickness of such walls. Bearing walls shall in no case be less than 16 inches. Fireplaces and chimneys of unburned clay units shall be lined with firebrick not less in thickness than four inches. All footing walls which support masonry of unburned clay units shall extend to an elevation not less than six inches above the adjacent ground at all points.

(b) **Units.** At the time of laying, all units shall be clean and damp at the surface.

(c) **Mortar and Bond.** All joints shall be solidly filled with Type M or S mortar. Bond shall be provided as specified for masonry of hollow units in Section 91.2411.

(d) **Stresses.** All masonry of unburned clay units shall be so constructed that the unit stresses do not exceed those set forth in Table No. 24-G. Bolt values shall not exceed those set forth in Table No. 24-B.

(e) **Soil.** The soil used shall contain not less than 25% and not more than 45% of material passing a No. 200 mesh sieve. The soil shall contain sufficient clay to bind the particles together but shall not contain more than 0.2% of water-soluble salts.

(f) **Stabilizer.** The stabilizing agent shall be emulsified asphalt. The stabilizing agent shall be uniformly mixed with the soil in amounts sufficient to provide the required resistance to absorption.

(g) **Sampling.** Each of the tests prescribed in this Section shall be applied to five sample units selected at random from each 5,000 bricks to be used.

(h) **Compressive Strength.** The units shall have an average compressive strength of 300 pounds per square inch when tested in accordance with A.S.T.M. Designation C67. One sample out of five may have a compressive strength of not less than 250 pounds per square inch.

(i) **Modulus of Rupture.** The unit shall average 50 pounds per

TABLE NO. 24-B — ALLOWABLE SHEAR ON BOLTS
Masonry of Unburned Clay Units

DIAMETER OF BOLTS (Inches)	EMBEDMENTS (Inches)	SHEAR (Pounds)
$\frac{1}{2}$	----	-----
$\frac{5}{8}$	12	200
$\frac{3}{4}$	15	300
$\frac{7}{8}$	18	400
1	21	500
$1\frac{1}{8}$	24	600

square inch in modulus of rupture when tested according to the following procedure:

1. A cured unit shall be laid over cylindrical supports two inches in diameter, located two inches from each end, and extending across the full width of the unit.

2. A cylinder two inches in diameter shall be laid midway between and parallel to the supports.

3. Load shall be applied to the cylinder at the rate of 500 pounds per minute until rupture occurs.

4. The modulus of rupture is equal to $\frac{3 WL}{2 Bd^3}$

WHERE:

W = Load of rupture

L = Distance between supports

B = Width of brick

d = Thickness of brick

(j) **Moisture Content.** The moisture content of the unit shall be not more than 4% by weight.

(k) **Absorption.** A dried four-inch cube cut from a sample unit shall absorb not more than 2½% moisture by weight when placed upon a constantly water-saturated porous surface for seven days.

(l) **Shrinkage Cracks.** No units shall contain more than three shrinkage cracks, and no shrinkage crack shall exceed three inches in length or ¼ inch in width.

SEC. 91.2406 — GYPSUM MASONRY

(a) **General.** Gypsum masonry is that form of construction made with gypsum block or tile in which the units are laid and set in gypsum mortar. Gypsum masonry shall not be used in any bearing wall or where exposed directly to the weather or where subject to frequent or continuous wetting.

(b) **Materials.** Gypsum masonry shall be gypsum block or tile laid up in gypsum mortar composed of one part gypsum and not more than three parts sand by weight.

(c) **Stresses.** All gypsum masonry shall be so constructed that the unit stresses do not exceed those set forth in Table No. 24-G when computed on the gross cross-sectional area.

(d) **Bond.** The bond in gypsum masonry shall conform to the requirements for bond in masonry or hollow units specified in Section 91.2411.

(e) **Method of Laying.** All units in gypsum masonry shall be placed in side construction with cells horizontal. The entire

TABLE NO. 24-C — MINIMUM ULTIMATE COMPRESSIVE STRENGTH AND MODULUS OF ELASTICITY OF REINFORCED GYPSUM CONCRETE

Class	Mixture	Com- pressive Strength p.s.i. (f_c)	Modulus of Elasticity p.s.i. (E)	Es/Eg (n)	Modulus of Rigidity
A	Not more than 12 ½ per cent by weight of wood chips, shavings, or fiber	500	200,000	150	.36E
B	Not more than three per cent by weight of wood chips, shavings, or fiber	1000	600,000	50	.40E

bearing surface of every unit shall be covered with mortar spread in an even layer, and all joints shall be filled with mortar.

SEC. 91.2407 — REINFORCED GYPSUM CONCRETE

(a) General. Reinforced gypsum concrete shall consist of a mixture of gypsum with wood chips, shavings, or fiber or other approved aggregates, premixed at the mill, with only water added at the job, and shall conform to A.S.T.M. Designation C 317. Precast reinforced gypsum concrete shall contain not more than 3%, and cast-in-place reinforced gypsum concrete not more than 12 ½%, of wood chips, shavings, or fiber measured as a percentage by weight of dry mix.

Reinforced gypsum concrete shall develop the minimum ultimate compressive strength in pounds per square inch set forth in Table No. 24-C when dried to constant weight, with tests made on cylinders two inches in diameter and four inches long or on two-inch cubes.

Tests when required shall follow the procedure specified in ASTM Designation C472.

Continuous inspection by a Registered Deputy Building Inspector is required during the mixing and placing of Class A and Class B reinforced gypsum concrete.

The water ratio shall not exceed 8½ gallons of water per 80 pounds of Class A mill-mixed gypsum and not more than 7½ gallons of water per 80 pounds of Class B mill-mixed gypsum. A device approved by the Superintendent of Building shall be used for accurate measure of water or consistency of mixture.

Pouring of reinforced gypsum concrete in horizontal layers is prohibited, unless pour is completed before lower layer has set.

EXCEPTION: *Stiffening strips over formboard joints 1" thick and not over 12" wide may be poured separately.*

(b) Design. For precast slabs which cannot be analyzed in accordance with established principles of mechanics, the safe load, uniformly distributed, shall be taken as ½ of the total load causing failure in a full-size test panel with the load applied along two lines each distant ¼ of the clear span from the support.

The minimum thickness of reinforced gypsum concrete shall be two inches.

Precast gypsum concrete units shall be reinforced and, unless the shape or marking of the unit is such as to insure its being placed right side up, the reinforcement shall be placed symmetrically so that the unit can support its load either side up.

(c) **Stresses.** The maximum allowable unit working stresses in reinforced gypsum concrete shall not exceed the values set forth in Table No. 24-D except as specified in Division 23. Bolt values shall not exceed those set forth in Table No. 24-E.

Allowable shear in poured gypsum concrete diaphragms using standard hot-rolled bulb-tee subpurlins shall be determined by the formula: $Q = .16 f_r t C_1 + 1,000 (k_1 d_1 + k_2 d_2)$

WHERE:

- Q = Allowable shear on diaphragm in pounds per linear foot, which includes a one-third increase for short-time loading.
- f_r = Oven-dry compressive strength of gypsum in pounds per square inch.
- C_1 = 1.0 for Class A gypsum; 1.5 for Class B gypsum.
- t = Thickness of gypsum concrete between subpurlins in inches. For the purpose of computing diaphragm shear values, "t" shall be not less than 2 inches nor more than 4 inches.
- k_1 = Number of mesh wires per foot passing over subpurlins.
- d_1 = Diameter of mesh wires passing over subpurlins in inches except hexagonal mesh.
- k_2 = Number of mesh wires per foot parallel to subpurlins or .7 times the number of hexagonal wires. Note: $k_2 = 8.5$ for 2-inch hexagonal mesh woven of No. 19 gauge galvanized wire with additional longitudinal No. 16 gauge galvanized wires spaced every 3 inches across the width of the mesh.
- d_2 = Diameter in inches of mesh wires parallel to subpurlins or of hexagonal wires.

The solution of the above equation for commonly used thickness and mesh types for each class of gypsum would give the values set forth in Table No. 24-DD.

The increases permitted elsewhere in the Code for stresses resulting from wind and earthquake shall not be applicable to gypsum concrete.

Maximum span-depth ratio for poured gypsum concrete diaphragms shall be three to one where used for lateral support of masonry or concrete walls and four to one where used for lateral support of wood or light steel walls.

TABLE NO. 24-D — ALLOWABLE UNIT WORKING STRESS REINFORCED GYPSUM CONCRETE

Type of Stress	Factor	Class A	Class B
		(pounds per square inch)	
Flexural Compression	$.25f_g$	125	250
Axial Bearing	$.20f_g$	100	200
Shear for Vertical Loads Only	$.02f_g$	10	20
— BOND —			
For Plain Bars	$.02f_g$	10	20
For Deformed Bars or Electrically Welded Wire Mesh	$.03f_g$	15	30

TABLE NO. 24-DD — ALLOWABLE SHEAR VALUE IN POUNDS PER FOOT USING BULB TEE SUBPURLINS¹

Class of Gypsum Concrete	Concrete ³ Thickness (In inches)	Mesh Type ¹		
		4" x 8" No. 12 — No. 14 (Galvanized)	6" x 6" No. 10 — No. 10	Hexagonal ² (Galvanized)
A	2	600	700	760
(500 psi)	2½	640	740	800
B	2	920	1020	1080
(1000 psi)	2½	1000	1140	1200

¹Mesh shall be lapped at least 4 inches or one mesh on ends and edges whichever is greater.

²Two-inch hexagonal mesh woven of No. 19 gauge galvanized wire with additional longitudinal No. 16 gauge galvanized wires spaced every 3 inches across the width of the mesh.

³Thickness over the subpurlins shall be not less than 5/8 inch.

⁴Shear values in the table include the 1/3 increase for wind or seismic loading.

TABLE NO. 24-E — SHEAR ON ANCHOR BOLTS AND DOWELS IN REINFORCED GYPSUM CONCRETE SUBJECT TO WIND OR SEISMIC FORCES ONLY

Bolt or Dowel Size (Inches)	Embedment (Inches)	Shear (Pounds)
¾ Bolt	4	325
½ Bolt	5	450
¾ Bolt	5	650
¼ Plain dowel	6	250
¾ Deformed dowel	6	325
½ Deformed dowel	6	450

TABLE NO. 24-F — ALLOWABLE SHEAR ON BOLTS
All Masonry Except Gypsum and Unburned Clay Units

Diameter of Bolt (Inches)	Embedment** (Inches)	Plain Masonry (Shear in Lbs.)	Grouted Masonry (Shear in Lbs.)
½	4	350	550
¾	4	500	750
¾	5	750	1100
¾	6	1000	1500
1	7	1250	1850*
1½	8	1500	2250*

*Permitted only with not less than 2,500 psi units.

**An additional 2 inches of embedment shall be provided for anchor bolts in the top of columns.

SEC. 91.2408 — GLASS MASONRY

(a) **General.** Masonry of glass blocks may be used in non-load-bearing exterior or interior walls and in openings which might otherwise be filled with windows, either isolated or in continuous bands, provided the glass block panels have a minimum thickness of $3\frac{1}{2}$ inches at the mortar joint and the mortared surfaces of the blocks are treated for mortar bonding.

(b) **Horizontal Forces.** The panels shall be restrained laterally to resist the horizontal forces specified in Division 23 for bearing walls.

(c) **Size of Panels.** Glass block panels for exterior walls shall not exceed 144 square feet of unsupported wall surface nor 15 feet in any dimension. For interior walls, glass block panels shall not exceed 250 square feet of unsupported area nor 25 feet in any dimension.

(d) **Mortar.** Glass block shall be laid in Type M or Type S mortar. Both vertical and horizontal mortar joints shall be at least $\frac{1}{4}$ -inch and not more than $\frac{3}{4}$ -inch thick and shall be completely filled.

(e) **Expansion Joints.** Every exterior glass block panel shall be provided with $\frac{1}{2}$ -inch expansion joints at the sides and top. Expansion joints shall be entirely free of mortar, and shall be filled with resilient material.

SEC. 91.2409 — STONE MASONRY

(a) **General.** Stone masonry is that form of construction made with natural or cast stone in which the units are laid and set in mortar, with all joints thoroughly filled.

(b) **Construction.** In ashlar masonry, bond stones uniformly distributed shall be provided to the extent of not less than 10% of the area of exposed facets.

Rubble stone masonry 24 inches or less in thickness shall have bond stones with a maximum spacing of three feet vertically and three feet horizontally, and, if the masonry is of greater thickness than 24 inches, shall have one bond stone for each six square feet of wall surface on both sides.

(c) **Minimum Thickness.** Stone masonry walls shall in no case have a minimum thickness of less than 16 inches.

(d) **Stresses.** The allowable unit working stresses in stone masonry shall not exceed the values set forth in Table No. 24-G.

SEC. 91.2410 — CAVITY WALL MASONRY

Construction using cavity wall masonry is not permitted.

SEC. 91.2411 — PLAIN HOLLOW UNIT MASONRY

(a) **General.** Hollow unit masonry is that type of construction made with hollow masonry units in which the units are all laid and set in mortar.

All units shall be laid with full face shell mortar beds. All head and end joints shall be filled solidly with mortar for a distance in from the face of the unit or wall not less than the thickness of the longitudinal face shells except in masonry beams in which case all head (or end) joints shall be filled solidly with mortar for the entire width of the unit.

(b) **Construction.** Where two or more hollow units are used to make up the thickness of a wall, the stretcher courses shall be bonded at vertical intervals not exceeding 34 inches by lapping at least four inches over the unit below or by lapping at

**TABLE NO. 24-G — ALLOWABLE WORKING STRESSES
IN UNREINFORCED UNIT MASONRY****

MATERIAL Grade of Unit	Com- pres- sion	TYPE S MORTAR		TYPE N MORTAR	
		Tension In Flexure or Shear		Tension In Flexure or Shear	
		Yes	No	Yes	No
Continuous Inspection Required	No				
PLAIN SOLID BRICK MASONRY					
4500 plus p.s.i.	250	20	10	200	15 7.5
2500 to 4500 p.s.i.	175	20	10	140	15 7.5
1500 to 2500 p.s.i.	125	20	10	100	15 7.5
PLAIN SOLID CONCRETE BRICK UNITS					
Grade A	175	12	6	125	12 6
Grade B	125	12	6	100	12 6
PLAIN GROUTED MASONRY					
4500 plus p.s.i.	350	25	12.5		
2500 to 4500 p.s.i.	275	25	12.5		
1500 to 2500 p.s.i.	225	25	12.5		
HOLLOW UNIT MASONRY	85	12*	6*	70	10* 5*
STONE MASONRY					
Cast Stone	400	8	4	320	8 4
Natural Stone	140	8	4	100	8 4
GYPSUM MASONRY	20	—	—	20	— —
UNBURNED CLAY MASONRY	30	8	4	—	— —

*Net area.

**Allowable working stresses, p.s.i., gross cross-sectional area (except as noted).

vertical intervals not exceeding 17 inches with units which are at least 50% greater in thickness than the units below.

(c) Stresses. All hollow unit masonry shall be so constructed that the unit stresses do not exceed those set forth in Table No. 24-G.

SEC. 91.2412 — PLAIN SOLID MASONRY

(a) General. Plain solid masonry shall be brick, concrete brick, or solid load-bearing concrete masonry units laid continuously in mortar.

All units shall be laid with full shoved mortar joints, and all head, bed, and wall joints shall be solidly filled with mortar.

(b) Construction. The facing and backing shall be bonded so that not less than 4% of the wall surface of each face is composed of bonders (headers) extending not less than four inches into the backing. The distance between adjacent full-length headers shall not exceed 24 inches either vertically or horizontally. In walls in which a single bonder does not extend through the wall, bonders from the opposite sides shall overlap at least four inches, or bonders from opposite sides shall be covered with another bonder course overlapping the bonder below at least four inches.

(c) Moisture Content. For moisture content, see Section 91.2403 (u).

(d) Stresses. All plain solid masonry shall be so constructed that the unit stresses do not exceed those set forth in Table No. 24-G.

SEC. 91.2413 — PLAIN GROUTED MASONRY

(a) **General.** Plain grouted masonry is that form of construction made with brick or solid concrete brick units in which interior joints of masonry are filled by pouring grout therein as the work progresses.

(b) **Materials.** At the time of laying, all masonry units shall be free of excessive dust and dirt. For moisture content, see Section 91.2403(u). Only Type M or Type S mortar shall be used.

(c) **Construction.** Requirements for construction shall be as follows: 1. All units in the two outer tiers shall be laid with full shovled head and bed mortar joints.

***EXCEPTION:** If full shovled head joints are not used, the head joints shall be not less than $\frac{3}{8}$ -inch in thickness.*

2. All longitudinal vertical joints and grout spaces shall be grouted and shall be not less than $\frac{3}{4}$ -inch in thickness. In members of three or more tiers in thickness, interior bricks shall be embedded into the grout so that at least $\frac{3}{4}$ -inch of grout surrounds the sides and ends of each unit. All grout shall be puddled with a grout stick immediately after pouring.

3. One exterior tier may be carried up 16 inches before grouting, but the other exterior tier shall be grouted in lifts not to exceed six times the width of the grout space with a maximum of eight inches.

4. If the work is stopped for one hour or longer, the horizontal construction joints shall be formed by stopping all tiers at the same elevation and with the grout one inch below the top.

(d) **High-Lift Grouted Construction.** 1. All units in the two tiers shall be laid with full head and bed mortar joints.

2. The two tiers shall be bonded together with wall ties. Ties shall be not less than No. 9 wire in the form of rectangles four inches wide and of a length two inches less than the overall wall thickness. Kinks, water drips or deformations shall not be permitted in the ties. One tier of the wall shall be built up not more than 18 inches ahead of the other tier. Ties shall be laid not to exceed 24 inches on center horizontally and 16 inches on center vertically for running bond and not more than 24 inches on center horizontally and 12 inches on center vertically for stack bond.

3. Cleanouts shall be provided for each pour by leaving out every other unit in the bottom tier of the section being poured. During the work a high pressure jet stream of water shall be used to remove mortar fins and any other foreign matter from the grout space. The cleanout shall be sealed after inspection and before grouting.

4. The grout space (longitudinal vertical joint) shall be not less than three inches in width and not less than the thickness required by the placement of steel with the required clearances and shall be poured solidly with grout. Masonry walls shall cure at least three days to gain strength before pouring grout.

***EXCEPTION:** If the grout space contains no horizontal steel, it may be reduced to two inches.*

5. Vertical grout barriers or dams shall be built of solid masonry across the grout space the entire height of the wall to control the flow of the grout horizontally. Grout barriers shall be not more than 25 feet apart.

6. Grout shall be a plastic mix suitable for pumping without segregation of the constituents and shall be mixed thoroughly.

TABLE NO. 24-H — MAXIMUM WORKING STRESSES IN POUNDS PER SQUARE INCH FOR REINFORCED SOLID AND HOLLOW UNIT MASONRY ⁽¹⁾

Type of Stress	Special Inspection Required	
	Yes	No
Compression-Axial, Walls	See Section 91.2418	One-half of the values permitted under Section 91.2418
Compression-Axial, Columns	See Section 91.2420	One-half of the values permitted under Section 91.2420
Compression-Flexural	.33 f'm but not to exceed 900	.166 f'm but not to exceed 450
Shear: ⁽⁵⁾ No shear reinforcement ⁽²⁾	.02 f'm but not to exceed 50	15
Reinforcement taking entire shear: Flexural members	.05 f'm but not to exceed 120	50
Shear Walls	.04 f'm but not to exceed 75	30
Modulus of Elasticity ⁽³⁾	1000 f'm but not to exceed 3,000,000	500 f'm but not to exceed 1,500,000
Modulus of Rigidity ⁽³⁾	400 f'm but not to exceed 1,200,000	200 f'm but not to exceed 600,000
Bearing on full area ⁽⁴⁾	.25 f'm but not to exceed 900	.125 f'm but not to exceed 450
Bearing on 1/2 or less of area ⁽⁴⁾	.30 f'm but not to exceed 1200	.15 f'm but not to exceed 600
Bond-Plain bars	60	30
Bond-Deformed	140	100

NOTES: (1) Stresses for hollow unit masonry are based on NET section.

(2) Web reinforcement shall be provided to carry the entire shear in excess of 20 pounds per square inch wherever there is required negative reinforcement and for a distance of one-sixteenth the clear span beyond the point of inflection.

(3) Where determinations involve rigidity consideration in combination with other materials or where deflections are involved, the moduli of elasticity and rigidity under columns entitled "yes" for special inspection shall be used.

(4) This increase shall be permitted only when the least distance between the edges of the loaded and unloaded areas is a minimum of one-fourth of the parallel side dimension of the loaded area. The allowable bearing stress on a reasonable concentric area greater than one-third, but less than the full area, shall be interpolated between the values given.

(5) Shear walls which resist seismic forces shall be designed to resist 1.5 times the forces as determined by Section 91.2305(d)2.

Grout shall be placed by pumping or by an approved alternate method and shall be placed before any initial set occurs but in no case more than one and one-half hours after water has been added.

7. Grouting shall be done in a continuous pour, in lifts not exceeding four feet. It shall be consolidated by puddling or mechanical vibrating during placing and reconsolidated after excess moisture has been absorbed but before plasticity is lost. The grouting of any section of a wall between control barriers shall be completed in one day with no interruptions greater than one hour.

8. Special inspection during grouting shall be provided in accordance with Section 91.0310 of the Code, however, the work shall not qualify for the stresses entitled "Special Inspection" in Table No. 24-H unless continuously inspected during all phases of masonry construction.

9. When brick absorption exceeds five per cent, an admixture approved for grout shrinkage reduction or other approved methods shall be used to limit grout volume loss.

(e) Stresses. All plain grouted masonry shall be so constructed that the unit stresses do not exceed those set forth in Table No. 24-G.

SEC. 91.2414 — REINFORCED GROUTED MASONRY

(a) **General.** Reinforced grouted masonry shall conform to all of the requirements for plain grouted masonry specified in Section 91.2413 and also the requirements of this Section.

(b) **Construction.** The thickness of grout or mortar between brick and steel shall be not less than $\frac{1}{4}$ -inch except that $\frac{1}{4}$ -inch bars may be laid in horizontal mortar joints at least $\frac{1}{2}$ -inch thick and steel wire reinforcement may be laid in horizontal mortar joints at least twice the thickness of the wire diameter.

(c) **Stresses.** All reinforced grouted masonry shall be so designed and constructed that the unit stresses do not exceed those set forth in Table No. 24-H.

SEC. 91.2415 — REINFORCED HOLLOW UNIT MASONRY

(a) **General.** Reinforced hollow unit masonry is that construction made with hollow masonry units in which certain cells are continuously filled with concrete or grout, and in which reinforcement is embedded. Reinforced hollow unit masonry shall conform to all of the requirements for plain hollow unit masonry specified in Section 91.2411 and also the requirements of this Section. Only Type M or Type S mortar shall be used.

(b) **Construction.** Requirements for construction shall be as follows: 1. All reinforced hollow unit masonry shall be built to preserve the unobstructed vertical continuity of the cells to be filled. Walls and cross webs forming such cells to be filled shall be full-bedded in mortar to prevent leakage of grout. All head (or end) joints shall be solidly filled with mortar for a distance in from the face of the wall or unit not less than the thickness of the longitudinal face shells. Bond shall be provided by lapping units in successive vertical courses or by equivalent mechanical anchorage.

2. Vertical cells to be filled shall maintain a clear, unobstructed, continuous vertical cell measuring not less than 3 inches by 3 inches for high lift grouting, 4 inches by 4 inches when coarse grout is used, and 2 inches by 3 inches for all other conditions. Any overhanging mortar or other obstruction shall be removed from the cells.

3. Cleanout openings shall be provided at the bottoms of all cells to be filled. The cleanouts shall be sealed before grouting, after inspection.

EXCEPTION: Cleanout openings are not required where the the wall is constructed in lifts not exceeding 4 feet and grout is poured before constructing additional wall.

4. Vertical reinforcement shall be held in position at top and bottom and at intervals not exceeding 192 diameters of the reinforcement.

5. All cells containing reinforcement shall be filled solidly with grout. The grout shall be consolidated by puddling or vibrating during placing and reconsolidated after excess moisture has been absorbed but before plasticity is lost.

Grouting may be done in one of the following methods:

A. Four foot lift of grout poured after block is laid to a height of 4 feet. This sequence is repeated for the full wall height.

B. Eight foot lift of grout poured after block is laid to a height not exceeding eight feet. The grout is poured in two 4 foot lifts, with no interruption exceeding 1 hour between grout lifts.

C. Continuous grout pour, poured in 4-foot lifts after block

is laid to full height of wall with no interruptions exceeding 1 hour between grout lifts. Special inspection during grouting is required. Special inspection at time of grouting shall not be considered as special inspection under Table 24-H. The work shall not qualify for the stresses entitled "Special Inspection" in Table 24-H unless continuously inspected during all phases of masonry construction.

(c) **Stresses.** All reinforced hollow unit masonry shall be so designed and constructed that the unit stresses do not exceed those set forth in Table No. 24-H.

SEC. 91.2416 — GENERAL CONSTRUCTION REQUIREMENTS

(a) **Freezing.** All masonry shall be protected against freezing for at least 48 hours after being laid. No masonry shall be built upon frozen material.

(b) **Corbelling.** Corbels may be built only into solid masonry walls 12 inches or more in thickness. The projection for each course in such corbel shall not exceed one inch and the maximum projection shall not exceed $\frac{1}{3}$ the total thickness of the wall when used to support structural members, and not more than six inches when used to support a chimney built into the wall. The top course of all corbels shall be a header course.

(c) **Wood.** No structural masonry shall be supported by wood members except as permitted in Division 23.

(d) **Masonry Foundations.** In one-story buildings having wood frame exterior walls, foundations not over 24 inches high may be constructed of masonry units without mortared head joints, provided the masonry units permit horizontal flow of the grout to adjacent units.

(e) **Minimum Bar Spacing.** The minimum clear distance between parallel bars, except in columns, shall be not less than the diameter of the bar except that lapped splices may be wired together. The center-to-center spacing of bars within a column shall be not less than two and one-half times the bar diameter.

(f) **Splices in Reinforcement.** Splices may be made only at such points and in such manner that the structural strength of the member will not be reduced. Lapped splices shall provide sufficient lap to transfer the working stress of the reinforcement by bond and shear, but in no case shall the lap be less than 30 bar diameters. Welded or mechanical connections shall develop the strength of the reinforcement.

(g) **Protection for Reinforcement.** All bars shall be completely embedded in mortar or grout. Joint reinforcement embedded in horizontal mortar joints shall have not less than $\frac{1}{2}$ -inch mortar coverage from the exposed face. All other reinforcement shall have a minimum coverage of one bar diameter over all bars, but not less than $\frac{3}{4}$ -inch except where exposed to weather or soil in which cases the minimum coverage shall be two inches.

SEC. 91.2417 — GENERAL DESIGN

(a) **Combination of Units.** In walls or other structural members composed of different kinds or grades of units, materials, or mortars, the maximum stress shall not exceed the allowable stress for the weakest of the combinations of units, materials, and mortars of which the member is composed. The thickness of any facing which is used to resist stress shall be not less than $1\frac{1}{2}$ inches.

(b) **Thickness of Walls.** For arbitrary limits of walls as specified in this Division nominal thickness shall be used. Stresses

**TABLE NO. 24-I—MINIMUM THICKNESS OF
MASONRY WALLS**

TYPE OF MASONRY	Max. Ratio Unsupported Height or Length to Thickness	Nominal Minimum Thickness (Inches)
Bearing Walls:		
Unburned Clay Masonry	10	16
Reinforced Grouted Masonry	25	6
Reinforced Hollow Unit Masonry	25	6
Nonbearing Walls:		
Exterior Reinforced Walls	30	2
Interior Partitions Unreinforced	36	2
Interior Partitions Reinforced	48	2

shall be determined on the basis of the net thickness of the masonry, with consideration for reductions such as raked joints.

The thickness of masonry walls shall be designed so that allowable maximum stresses specified in this Division are not exceeded and so that all masonry walls shall not exceed the height or length to thickness ratio nor the minimum thickness as specified in this Division and as set forth in Table No. 24-I.

(c) **Piers.** Every structural pier whose width is less than three times its thickness shall be designed and constructed as required for columns.

(d) **Chases and Recesses.** Chases and recesses in masonry walls shall be designed and constructed so as not to reduce the required strength or required fire resistance of the wall.

(e) **Pipes and Conduits Embedded in Masonry.** No pipe or conduit shall be embedded in any structural masonry or required fireproofing.

EXCEPTIONS: 1. Rigid electric conduits may be embedded in structural masonry when their location has been detailed on the approved plans.

2. Any pipe or conduit may pass vertically or horizontally through any masonry by means of a sleeve at least large enough to pass any hub or coupling on the pipe line. Such sleeves shall be placed not closer than three diameters, center to center, nor shall they unduly impair the strength of construction.

3. Placement of pipes or conduits in unfilled cores of hollow unit masonry shall not be considered as embedment.

(f) **Arches and Lintels.** Members supporting masonry shall be of incombustible materials.

(g) **Anchorage.** Masonry walls shall be anchored to floors and roofs as required in Division 23.

(h) **Combined Axial and Flexural Stresses.** Members subject to combined axial and flexural stresses shall be designed as specified in Division 23.

(i) **Allowable Reduction of Bending Stress by Vertical Load.** In calculating maximum tensile fiber stress due to lateral forces other than earthquake forces, the maximum tensile fiber stress may be reduced by the direct stress due to vertical dead loads. In calculating maximum tensile fiber stress due to earthquake forces, the maximum tensile fiber stress may be reduced by not

more than 50 per cent of the direct stress due to vertical dead loads.

(j) **Unreinforced Masonry.** Design and construction of elements of plain masonry shall be such that unit stresses do not exceed those set forth in tables in this Division for the various masonry units.

(k) **Partially Reinforced Masonry.** Partially reinforced masonry is considered as unreinforced masonry for purposes of this Division.

(l) **Reinforced Masonry.** All reinforced masonry shall be so designed and constructed that the unit stresses do not exceed those set forth in Table No. 24-H.

The design and construction of reinforced masonry shall be based on the assumptions, requirements and methods of stress determination specified for reinforced concrete in Division 26 except as specified in this Division.

All plans submitted for approval shall clearly show the assumed strength of masonry for which all parts of the structure were designed.

(m) **Allowable Steel Stresses.** Steel reinforcement for masonry shall conform to the specifications for steel reinforcement in concrete set forth in Division 26 of this Code and stresses in reinforcement shall not exceed the following:

<u>TENSILE STRESS:</u>	<u>POUNDS PER SQUARE INCH</u>
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For billet steel or axle steel reinforcing bars of structural grade	18,000
For deformed bars with a yield strength of 60,000 pounds per square inch or more and in sizes No. 11 and smaller	24,000
Joint reinforcement 50 per cent of the minimum yield point specified in ASTM Designation A82 for the particular kind and grade of steel used, but in no case to exceed	30,000
For all other reinforcement	20,000

COMPRESSIVE STRESS IN COLUMN VERTICALS:

40 per cent of the minimum yield strength, but not to exceed	24,000
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COMPRESSIVE STRESS IN FLEXURAL MEMBERS:

For compression reinforcement in flexural members, the allowable stress shall not be taken as greater than the allowable tensile stress shown above.

The modulus of elasticity of steel reinforcement may be taken as 30,000,000 pounds per square inch.

(n) **Bolt Values.** The allowable loads on bolts shall not exceed the values set forth in Table No. 24-F.

(o) **Stack Bond.** Where masonry units are laid in stack bond in plain masonry, mechanical bond shall be provided by placing one continuous No. 9 gage wire or its equivalent in the horizontal bed joint for each four-inch thickness of the masonry unit and spaced not more than 16 inches on centers vertically.

(p) **Symbols and Notations.** The symbols and notations used in this Section are defined as follows:

- α = Angle between inclined web bars and axis of beam.
 A_v = Total area of web reinforcement in tension within a distance of "s", or the total area of all bars bent up in any one plane.

b	=	Width of rectangular section or width of flange of I or T-sections.
d	=	Depth from compression face of beam or slab to centroid of longitudinal tensile reinforcement.
E_m	=	Modulus of elasticity of masonry in compression.
E_s	=	Modulus of elasticity of steel in tension or compression (30,000,000 pounds per square inch).
f_m	=	Allowable compressive unit stress in extreme fiber in flexure.
f'_m	=	Ultimate compressive strength, usually at age of 28 days, as specified in Section 91.2404(c).
f_v	=	Allowable tensile unit stress in web reinforcement.
j	=	Ratio of distance between centroid of compression and centroid of tension to the depth "d".
n	=	Ratio of modulus of elasticity of steel to that of masonry = $\frac{E_s}{E_m}$
Σo	=	Sum of perimeters of bars in one set.
s	=	Spacing of stirrups or of bent bars in a direction parallel to that of the main reinforcement.
u	=	Bond stress per unit of surface area of bar.
v	=	Shearing unit stress.
v_m	=	Allowable unit shearing stress in the masonry.
V	=	Total shear.

(q) **Reinforced Masonry Flexural Design.** The design of reinforced masonry shall be in accordance with the following principal assumptions:

1. A section that is plane before bending remains plane after bending.
2. Moduli of elasticity of the masonry and of the reinforcement remain constant.
3. Tensile forces are resisted only by the tensile reinforcement.
4. Reinforcement is completely surrounded by and bonded to masonry material so that they will work together as a homogeneous material within the range of working stresses.

(r) **Flexural Computations.** 1. General. All members shall be designed to resist at all sections the maximum bending moment and shears produced by dead load, live load, and other forces as determined by the principle of continuity and relative rigidity.

2. Distance between lateral supports. The clear distance between lateral supports of a beam shall not exceed 32 times the least width of the compression flange or face.

(s) **Shear and Diagonal Tension.** 1. Shearing unit stress. The shearing unit stress "v" in reinforced masonry flexural members shall be computed by

$$v = \frac{V}{bjd} \dots\dots\dots (1)$$

Where the value of the shearing unit stress computed by Formula (1) exceeds the shearing unit stress " v_m " permitted on masonry, web reinforcement shall be provided to carry the entire stress.

2. Types of web reinforcement. Web reinforcement may consist of:

- A. Stirrups or web reinforcement bars perpendicular to the longitudinal steel.
- B. Stirrups or web reinforcement bars welded or otherwise

rigidly attached to the longitudinal steel and making an angle of 30 degrees or more thereto.

C. Longitudinal bars bent so that the axis of the inclined portion of the bar makes an angle of 15 degrees or more with the axis of the longitudinal portion of the bar.

D. Special arrangements of bars with adequate provisions to prevent slip of bars or splitting of masonry by the reinforcement. Stirrups or other bars to be considered effective as web reinforcement shall be anchored at both ends.

3. **Stirrups.** The area of steel required in stirrups placed perpendicular to the longitudinal reinforcement shall be computed by Formula (2):

$$A_v = \frac{V_s}{f_v j d} \dots\dots\dots (2)$$

Inclined stirrups shall be proportioned in accordance with the provisions of paragraph 4 of this Subsection.

4. **Bent bars.** Only the center three-fourths of the inclined portion of any longitudinal bar that is bent up for web reinforcement shall be considered effective for that purpose, and such bars shall be bent around a pin having a diameter not less than six times the bar size.

When the web reinforcement consists of a single bent bar or of a single group of parallel bars all bent up at the same distance from the support, the required area of such bars shall be computed by Formula (3):

$$A_v = \frac{V}{f_v \sin \alpha} \dots\dots\dots (3)$$

Where there is a series of parallel bars or groups of bars bent up at different distances from the support, the required area shall be determined by Formula (4):

$$A_v = \frac{V_s}{f_v j d (\sin \alpha - \cos \alpha)} \dots\dots\dots (4)$$

5. **Spacing of web reinforcement.** Where web reinforcement is required it shall be so spaced that every 45-degree line (representing a potential crack) extending from the mid-depth of the beam to the longitudinal tension bars shall be crossed by at least one line of web reinforcement.

(t) **Bond and Anchorage.** 1. **Computation of bond stress in beams.** In flexural members in which the tensile reinforcement is parallel to the compression face, the bond stress at any cross-section shall be computed by Formula (5):

$$u = \frac{V}{\sum o j d} \dots\dots\dots (5)$$

in which "V" is the shear at that section and " $\sum o$ " is taken as the perimeter of all effective bars crossing the section on the tension side. To be effective the bars must be properly developed by hooks, lap, or embedment on each side of the section. Bent-up bars that are not more than $d/3$ from the level of the main longitudinal reinforcement may be included. Critical sections occur at the face of the support, at each point where tension bars terminate within a span, and at the point of inflection.

Bond shall be similarly computed on compressive reinforcement, but the shear used in computing the bond shall be reduced in the ratio of the compressive force assumed in the bars to the

total compressive force at the section. Anchorage shall be provided by embedment past the section to develop the assumed compressive force in the bars at the bond stress in Table No. 24-H.

2. Anchorage requirements. Tensile negative reinforcement in any span of a continuous, restrained, or cantilever beam, or in any member of a rigid frame shall be adequately anchored by bond, hooks, or mechanical anchors in or through the supporting member. Every reinforcing bar within any such span except in a lapped splice, whether required for positive or negative moment, shall be extended at least 12 diameters beyond the point at which it is no longer needed to resist stress.

At least one-third of the total reinforcement provided for negative moment at the support shall be extended beyond the extreme position of the point of inflection a distance sufficient to develop by bond one-half the allowable stress in such bars, not less than one-sixteenth of the clear span length, or not less than the depth of the member, whichever is greater. The maximum tension in any bar must be developed by bond on a sufficient straight or bent embedment or by other anchorage.

The bar may be bent across the web at an angle of not less than 15 degrees with the longitudinal portion of the bar and be made continuous with the reinforcement which resists moment of opposite sign.

Of the positive reinforcement in continuous beams not less than one-fourth the area shall extend along the same face of the beam into the end support a distance of six inches.

In simple beams, or at the freely supported end of continuous beams, at least one-third the required positive reinforcement shall extend along the same face of the beam into the support a distance of six inches.

Compression steel in beams and girders shall be anchored by ties or stirrups not less than $\frac{1}{4}$ -inch in diameter, spaced not farther apart than 16 bar diameters or 48 tie diameters. Such ties or stirrups shall be used throughout the distance where compression steel is required.

3. Plain bars in tension. Plain bars in tension shall terminate in standard hooks except that hooks shall not be required on the positive reinforcement at interior supports of continuous members.

4. Anchorage of web reinforcement. Single separate bars used as web reinforcement shall be anchored at each end by one of the following methods:

A. Welding to longitudinal reinforcement.

B. Hooking tightly around the longitudinal reinforcement through at least 180 degrees.

C. Embedment above or below the mid-depth of the beam on the compression side, a distance sufficient to develop the stress to which the bar will be subject at a bond stress of not to exceed the bond stresses permitted in Table No. 24-H.

D. By a standard hook, considered as developing 7500 pounds per square inch plus embedment sufficient to develop by bond the remaining stress in the bar at the unit stress set forth in Table No. 24-H. The effective embedded length shall not be assumed to exceed the distance between the mid-depth of the beam and the tangent of the hook.

The extreme ends of bars forming a simple U-or multiple-stirrups shall be anchored by one of the methods of this Sub-section or shall be bent through an angle of at least 90 degrees tightly around a longitudinal reinforcing bar not less in dia-

meter than the stirrup bar, and shall project beyond the bend at least 12 diameters of the stirrup bar.

The loops or closed ends of such stirrups shall be anchored by bending around the longitudinal reinforcement through an angle of at least 90 degrees, or by being welded or otherwise rigidly attached thereto.

Between the anchored ends, each bend in the continuous portion of a U- or multiple U-stirrup shall be made around a longitudinal bar. Hooking or bending stirrups around the longitudinal reinforcement shall be considered effective only when these bars are perpendicular to the longitudinal reinforcement.

Longitudinal bars bent to act as web reinforcement shall, in a region of tension, be continuous with the longitudinal reinforcement. The tensile stress in each bar shall be fully developed in both the upper and the lower half of the beam by adequate anchorage through bond or hooks.

5. Hooks. The terms "hook" or "standard hook" as used herein shall mean either:

A. A complete semicircular turn with a radius of bend on the axis of the bar of not less than three and not more than six bar diameters, plus an extension of at least four bar diameters at the free end of the bar.

B. A 90-degree bend having a radius of not less than four bar diameters plus an extension of 12 bar diameters.

C. For stirrup anchorage only, a 135-degree turn with a radius on the axis of the bar of three diameters, plus an extension of at least six bar diameters at the free end of the bar.

Hooks having a radius of bend of more than six bar diameters shall be considered merely as extensions to the bars.

In general, hooks shall not be permitted in the tension portion of any beam except at the ends of simple or cantilever beams or at the freely supported ends of continuous or restrained beams.

No hook shall be assumed to carry a load which would produce a tensile stress in the bar greater than 7500 pounds per square inch.

Hooks shall not be considered effective in adding to the compressive resistance of bars.

Any mechanical device capable of developing the strength of the bar without damage to the masonry may be used in lieu of a hook. Tests must be presented to show the adequacy of such devices.

SEC. 91.2418 — BEARING WALLS

(a) General. Masonry walls shall be designed as specified in Section 91.2417 and to withstand all vertical and horizontal loads as specified in Division 23 with due allowance for the effect of eccentric loads. Unreinforced masonry shall not be used in bearing walls.

EXCEPTION: Masonry of unburned clay units may be used in one-story buildings as specified in Section 91.2405.

(b) End Support. End support for beams, girders or other concentrated loads shall be provided as specified in Division 25.

(c) Width in Flexural Computations. In computing flexural stresses for masonry where reinforcement occurs, the effective width "b" shall not be more than six times the wall thickness in running bond, nor more than three times the wall thickness in stack bond.

(d) Distribution of Concentrated Loads. In calculating wall stresses, concentrated loads may be distributed over a maximum

length of wall not exceeding the center-to-center distance between loads.

Where the concentrated loads are not distributed through a structural element, the length of wall considered shall not exceed the width of the bearing plus four times the wall thickness.

Concentrated loads shall not be considered as distributed by metal ties nor distributed across continuous vertical joints.

(e) **Reinforced Masonry Walls.** 1. **Minimum thickness.** The minimum nominal thickness of reinforced masonry bearing walls shall be six inches and the ratio of height or length to thickness shall not exceed 25.

2. **Stresses.** The axial stress in reinforced masonry bearing walls shall not exceed the value determined by the following formula:

$$f_m = 0.20 f'_m \left[1 - \left(\frac{h}{40t} \right)^3 \right]$$

WHERE:

- f_m = Compressive unit axial stress in masonry wall.
- f'_m = Ultimate compressive masonry stress as determined by Section 91.2404(c). The value of f'_m shall not exceed 6000 pounds per square inch.
- h = Clear height in inches.
- t = thickness of wall in inches.

3. **Reinforcement.** All walls using stresses permitted for reinforced masonry shall be reinforced with both vertical and horizontal bars.

The minimum area of reinforcement in either direction shall be not less than .0007 (0.07 per cent) times the gross cross-sectional area of the wall taken perpendicular to the steel considered. The sum of the reinforcement to wall area ratios of horizontal and vertical steel shall be at least .002 (0.2 per cent).

Principal wall steel shall be limited to a maximum spacing of four feet on center except where two feet on center is required by Section 91.2305(k) in buildings utilizing a ductile moment-resisting space frame. The minimum diameter shall be $\frac{3}{8}$ -inch except that wire reinforcement used as temperature steel or to replace running bond may be used as part of the required reinforcement.

Reinforcing perpendicular to the principal wall steel shall be limited to a maximum spacing of four feet on center.

Horizontal reinforcement shall be provided in the top of footings, at the top of wall openings, at roof and floor levels, and at the top of parapet walls. Only horizontal reinforcement which is continuous in the wall shall be considered in computing the minimum area of reinforcement.

If the wall is constructed of more than two units in thickness, the reinforcement shall be equally divided into two layers, except where designed as retaining walls.

4. **Openings in Walls.** In all masonry bearing walls there shall be at least one $\frac{1}{2}$ inch bar, or two $\frac{3}{8}$ inch bars on all sides of, and adjacent to every opening which exceeds 24 inches in either direction and such bars shall extend not less than 40 diameters, but not less than 24 inches beyond the corners of the opening. The bars required by this Subdivision shall be in addition to the minimum reinforcement required by this Subsection.

SEC. 91.2419 — NONBEARING WALLS

(a) General. Nonbearing walls may be constructed of masonry as specified in this Division. Unreinforced masonry shall not be used in any exterior wall nor for interior partitions over 10 feet high.

EXCEPTION: Masonry of unburned clay units may be used in one-story buildings as specified in Section 91.2405.

(b) Thickness. Every nonbearing masonry wall shall be so constructed and have a sufficient thickness to withstand all vertical loads and horizontal loads, where specifically required by Division 23, but in no case shall the thickness of such walls (including plaster when applied) be less than the values set forth in Table No. 24-I.

(c) Wire-mesh Reinforcement. Wire-mesh reinforcement may be used to resist tensile stresses when embedded in plaster applied to the surface of any nonbearing wall. Wire-mesh reinforcement shall conform to the requirements of Division 26, and plaster shall conform to the requirements of Division 47.

(d) Anchorage. All nonbearing partitions shall be anchored along the top edge to a structural member or a suspended ceiling, or shall be provided with equivalent anchorage along the sides.

All exterior nonbearing walls shall be anchored along all edges to structural members.

SEE RULE OF GENERAL APPLICATION #18-69 IN APPENDIX SECTION

SEC. 91.2420 — COLUMNS

(a) General. Masonry columns shall be constructed of reinforced masonry and as required by this Section.

(b) Limiting Dimensions. The least dimension of every masonry column shall be not less than 12 inches unless designed for $\frac{1}{2}$ the allowable stresses, in which case the minimum least dimension shall be eight inches. No masonry column shall have an unsupported length greater than 20 times its least dimension.

(c) Allowable Loads. The axial load on columns shall not exceed:

$$P = A_g (0.18f'_m + 0.65 P_g f_s) \left[1 - \left(\frac{h}{40t} \right)^3 \right]$$

WHERE:

- P = Maximum concentric column axial load
- A_g = The gross area of the column
- f'_m = Ultimate compressive masonry strength as determined by Section 91.2404(c). The value of f'_m shall not exceed 6000 pounds per square inch.
- P_g = Ratio of the effective cross-sectional area of vertical reinforcement to A_g .
- f_s = Allowable stress in reinforcement [see Section 91.2417(m)]
- h = Clear height in inches.
- t = Least thickness of column in inches.

(d) Reinforcement. 1. Vertical reinforcement. The ratio (P_g) shall be not less than 0.5% nor more than 4%. The number of bars shall be not less than four, nor the diameter less than $\frac{3}{8}$ inch.

Where lapped splices are used, the amount of lap shall be sufficient to transfer the working stress by bond, but in no case

shall the length of lapped splice be less than 30 bar diameters, and welded splices shall be full butt welded.

2. Ties. Lateral ties shall be at least #3 bars and shall be spaced at not over 16 longitudinal bar diameters, 48 tie diameters, or the least dimension of the column. Lateral ties shall be placed not less than $1\frac{1}{2}$ inches and not more than five inches from the surface of the column.

Additional ties which engage at least four longitudinal column bars shall be provided around anchor bolts which are set in the top of the column. Such ties shall be within five inches of the top of the column and shall consist of not less than two #4 or three #3 bars.

DIVISION 25 — WOOD

SEC. 91.2501 — GENERAL

(a) **Quality and Design.** The quality and design of wood members, materials and fastenings shall conform to the provisions and standards specified in this Division and Division 4 of this Code.

(b) **Workmanship.** All members shall be framed, anchored, tied, and braced so as to develop the strength and rigidity necessary for the purposes for which they are used.

(c) **Fabrication.** Preparation, fabrication, and installation of wood members and their fastenings shall conform to accepted engineering practices and to the requirements of this Code.

Timber trusses and similar structural assemblies having members with a total cross-sectional area exceeding 24 square inches, or using connectors of a type not visible after assembly shall be:

1. Manufactured by a Type I Fabricator to whom an approval has been issued pursuant to Division C, Article 6, Chapter IX of the Los Angeles Municipal Code; or

2. Attested to by an approved testing agency as conforming to the requirements of this Division; or

3. Specifically approved by the Department.

(d) **Rejection.** The Department may deny permission for the use of a wood member where permissible grade characteristics or defects are present in such a combination that they affect the serviceability of the member.

(e) **Minimum Quality.** The capacity of structural framing members shall be based upon allowable stresses and design criteria specified in this Code.

Studs, joists, rafters, foundation plates or sills, planking 2 inches or more in depth, beams, stringers, posts, structural sheathing and similar load-bearing members shall be of at least the minimum grades set forth in this Division.

End-jointed lumber (finger-jointed), produced under rules established by the Superintendent of Building, may be used interchangeably with solid sawn 2-inch thick members of the same species and grade, provided such uses are limited to Repetitive-members such as joists, rafters, studs or decking, not less than 3 in number, contiguous or spaced not more than 24 inches o.c., and joined by a transverse floor or roof or other load distributing element or connection capable of effecting load transfer to adjacent members.

Utility grade lumber may be used only under conditions specified in this Code or where specifically approved by the Department.

(f) **Shrinkage.** Consideration shall be given in the design to the possible effect of cross grain dimensional changes considered vertically which may occur in lumber fabricated in a green condition.

(g) **Plywood.** All construction plywood used on walls, roofs and floors, including Underlayment, shall be bonded with exterior glue. This provision does not apply to plywood used only as an interior architectural finish material or as an overlay flooring over the required subfloor as specified in 91.4810(g). Plywood used in areas directly exposed to the weather shall be an Exterior Type. Plywood used in protected locations indirectly

exposed to the weather, such as eaves, soffits or porch ceilings, shall be bonded with exterior glue or shall be an Exterior Type.

(h) **Deflection.** The deflection of structural members such as trusses, beams, joists and other horizontal members, unless specifically shown otherwise in this Code, shall not exceed the proportion of span length, L , shown in the following table:

**MAXIMUM ALLOWABLE DEFLECTION
FOR STRUCTURAL MEMBERS⁽¹⁾**

	LIVE LOAD ONLY	LIVE LOAD PLUS DEAD LOAD⁽²⁾
Roof Member Supporting Plaster or Floor member	$L/360$	$L/240$

NOTES:

- (1) Sufficient slope or camber shall be provided to comply with the requirements of Section 91.2301(f) for roof drainage.
- (2) One-half the dead load may be used if the moisture content of the lumber when installed is less than 16 percent (as in glued laminated members).

SEC. 91.2502 — NOMENCLATURE

(a) **Definitions.** The following terms used in this Division shall have the meanings indicated in this subsection.

DURABLE WOOD is wood of natural resistance to decay and infestation conforming to Division 31.

FIBERBOARD is a fibrous-felted, homogenous panel made from lignocellulosic fibers (usually wood or cane) and having a density of less than 31 pounds per cubic foot but more than 10 pounds per cubic foot, conforming to ASTM D2277 or ASTM C208.

GLUED BUILT-UP MEMBERS are structural elements, the sections of which are composed of built-up lumber, plywood or plywood in combination with lumber; all parts bonded together with adhesives.

GRADE (Lumber), the classification of lumber in regard to strength and utility in accordance with the grading rules of an approved lumber grading agency.

NATIONAL DESIGN SPECIFICATION is the "National Design Specification for Stress-Grade Lumber and Its Fastenings" publication of recommendations by the National Forest Products Association.

NOMINAL SIZE (lumber), the commercial size designation of thickness and width (or width and depth) in standard sawn lumber in accordance with Product Standard PS-20.

NORMAL LOADING, a design load that stresses a member or fastening to the full allowable stress tabulated in this Division.

This loading may be applied for approximately 10 years, either continuously or cumulatively, and 90 percent of this load may be applied for the remainder of the life of the member or fastening.

PARTICLEBOARD, a mat-formed panel manufactured from lignocellulosic materials in the form of discrete pieces or particles, as distinguished from fibers, combined with a binder and bonded together under heat and pressure in accordance with Commercial Standard CS-236.

PLYWOOD, a built-up panel of laminated veneers conforming to Product Standard PS-1 and composed of Species Groups 1, 2, 3 or 4.

STRUCTURAL GLUED-LAMINATED TIMBER, any member

comprising an assembly of laminations of lumber in which the grain of all laminations is approximately parallel longitudinally; in which the laminations are bonded with adhesives; and which is fabricated in accordance with Product Standard PS-56.

TREATED WOOD, wood treated with approved preservatives in accordance with Division 31.

(b) **Symbols.** The symbols used in this Division have the following definitions:

A	= area of cross section.
b	= breadth (width) of rectangular member.
C	= coefficient, constant, or factor
C_c	= curvature factor.
C_f	= size factor.
C_f	= form factor.
C_s	= slenderness factor.
c	= distance from neutral axis to extreme fiber.
D	= diameter.
d	= depth of rectangular member, or least dimension of compression member.
E	= modulus of elasticity.
e	= eccentricity.
F_b	= allowable unit stress for extreme fiber in bending.
F'_b	= allowable unit stress for extreme fiber in bending, adjusted for slenderness.
f_b	= actual unit stress for extreme fiber in bending.
F_c	= allowable unit stress in compression parallel to grain.
F'_c	= allowable unit stress in compression parallel to grain adjusted for 1/d ratio where d is the least dimension.
f_c	= actual unit stress in compression parallel to grain.
$F_{c\perp}$	= allowable unit stress in compression perpendicular to grain.
$f_{c\perp}$	= actual unit stress in compression perpendicular to grain.
F_n	= allowable unit stress acting perpendicular to the inclined surface p.s.i. (Hankinson's Formula).
F_r	= allowable unit radial stress.
f_r	= actual unit radial stress.
F_{rc}	= allowable unit radial stress in compression.
f_{rc}	= actual unit radial stress in compression.
F_{rt}	= allowable unit radial stress in tension.
f_{rt}	= actual unit radial stress in tension.
F_t	= allowable unit stress in tension parallel to grain.
f_t	= actual unit stress in tension parallel to grain.
F_v	= allowable unit horizontal shear stress.
f_v	= actual unit horizontal shear stress.
h	= rise.
I	= moment of inertia.
L	= span length of beam, or unsupported length of column, feet.
l	= span length of beam, or unsupported length of column, inch.
M	= bending moment.
m	= unit bending moment.
N	= acting perpendicular to the inclined surface "lb" (Hankinson's Formula).
P	= total concentrated load, or axial compression load.
P/A	= induced axial load per unit of cross-sectional area.
Q	= statical moment of an area about the neutral axis.
R	= radius of curvature.
R_H	= horizontal reaction.
R_v	= vertical reaction.
r	= radius of gyration.
S	= section modulus.

T	=	total axial tension load.
t	=	thickness.
V	=	total vertical shear.
W	=	total uniform load.
w	=	uniform load per unit of length.
Δ_A	=	allowable deformation or deflection.
Δ_a	=	actual deformation or deflection.
θ	=	angle between the direction of load and the direction of grain, degrees (Hankinson's Formula).

SEC. 91.2503 — SIZE OF STRUCTURAL MEMBERS

Sizes of lumber referred to in this Code are nominal sizes. Computations to determine the required sizes of members shall be based on the net dimensions (actual sizes) and not the nominal sizes.

Members with dimensions other than standard dressed sizes shall have the actual dimensions shown on the plans.

SEC. 91.2504 — STRESSES

(a) **General.** Except as hereinafter provided, stresses shall not exceed the allowable unit stresses for the respective species and grades or fabricated products as set forth in Tables No. 25-A-1 and No. 25-A-2 for lumber, Table No. 25-B for plywood, and Table No. 25-C for structural glued-laminated timber.

The values for F_b and F_c tabulated in Table No. 25-A-1 for visually stress-rated lumber and in Table No. 25-A-2 for machine stress-rated lumber are for the design of structures when the strength of an individual member is premised on the assumption that each individual piece carries its design load.

The values for F_b (Repetitive) in Table No. 25-A-1 may be used in the design of an assembly of repetitive framing: such as tongue-and-groove planks and decking; or members such as joists, rafters, and studs not over 4 inches in thickness, spaced not more than 24" o.c., not less than three in number, and joined by transverse load distributing elements adequate to transfer load to adjacent members.

Stresses for species, grades, and Grading Rules not tabulated in this Division are approved for use if published in the National Forest Products Association—National Design Specification for Stress-Grade Lumber and Its Fastenings. Stresses for other species and grades are subject to Department approval.

(b) **Wood Poles or Piles.** The values tabulated in Table No. 25-E shall be used for the design of round timber poles and piles.

Poles and piles shall conform to the requirements set forth in ANSI Standard 05.1 and ASTM D25.

(c) **Adjustment of Stresses.** 1. **General.** The allowable unit stresses specified in this Division shall be subject to the adjustments set forth in the footnotes to the appropriate stress tables and to the requirement of this Subsection. The term "values" in this subsection refers to the allowable unit stresses specified in this Division.

2. **Preservative treatment.** The values for wood pressure impregnated with an approved process and preservative need no adjustment for treatment but are subject to other adjustments.

3. **Fire-retardant treatment.** The values shall be reduced 10 percent for lumber pressure impregnated with approved fire-retardant chemicals. The values for plywood so treated shall

be reduced 16 percent except for modulus of elasticity which shall be reduced 10 percent. Other adjustments are applicable.

Where structural glued-laminated timber is fire-retardant treated, values shall be reduced as recommended by the design engineer subject to concurrence by the Department.

4. Duration of load. Values for wood and mechanical fastenings (when the wood determines the load capacity) are subject to the following adjustments for the various durations of loading:

i. Where a member is fully stressed to the maximum allowable stress, either continuously or cumulatively, for more than 10 years under the conditions of maximum design load, the values shall not exceed 90 percent of those in the tables.

ii. When the duration of the full maximum load during the life of the member does not exceed the period indicated below, the values may be increased in the tables as follows:

25 percent for seven days duration; as for roof live loads on roof members

33½ percent for wind or earthquake, and further regulated by Section 91.2301(g) for earthquake design

100 percent for impact

The foregoing increases are not cumulative. For combined duration of loadings the resultant structural members shall not be smaller than required for the longer duration of loading.

iii. Values for normal loading conditions may be used without regard to impact if the stress induced by impact does not exceed the values for normal loading.

SEC. 91.2505 — GRADE AND IDENTIFICATION

All lumber, plywood, particleboard, fiberboard, glued-laminated timber, piles and poles regulated by this Division shall conform to the applicable standards or grading rules specified in this Code and shall be so identified by the grade mark of an approved grading agency.

Grademarked lumber that is remanufactured into smaller sizes by cross cutting, ripping, resawing or planing shall be regraded and remarked by an approved grading agency.

SEC. 91.2506 — HORIZONTAL MEMBERS

(a) **Beam Span.** For simple beams, the span shall be taken as the distance from face to face of supports, plus one-half the required length of bearing at each end; for continuous beams, the span is the distance between centers of bearing on supports over which the beam is continuous.

(b) **Flexure.** 1. **Circular cross section.** A beam of circular cross section may be assumed to have the same strength in flexure as a square beam having the same cross-sectional area. If a circular beam is tapered, it shall be considered a beam of variable cross section.

2. **Notching.** If possible, notching of beams should be avoided. For a beam notched at or near the middle of the span, the net depth for design shall be assumed as the member depth reduced by twice the notch depth when determining the flexural strength. For effect of notch on shear strength, see Subsection (d).

3. **Load Distribution.** The lateral distribution of a concentrated load from a critically loaded beam to adjacent parallel beams shall be calculated, including deflections.

Except for cantilevered members, the effect of continuity

in wood construction is not allowed without specific approval by the Department.

(c) **Horizontal Shear.** The maximum horizontal shear stress in a solid-sawn or glued-laminated wood beam shall not exceed that calculated by means of the formula:

$$f_v = \frac{3V}{2bd}$$

The actual unit shear stress, f_v , shall not exceed the allowable for the species and grade, as given in Table No. 25-A for solid-sawn lumber, and in Table No. 25-C for glued laminated lumber, adjusted for duration of loading, as provided in Subsection 91.2504(c).

When calculating the total vertical shear, V , distribution of load to adjacent parallel beams by flooring or other members may be considered and all loads within a distance from either support equal to the depth of the beam may be neglected.

(d) **Horizontal Shear in Notched Beams.** Where girders, beams, or joists are notched at points of support, they shall meet design requirements for net section in shear. The shear at such point shall not exceed the value calculated by the following formula:

$$V = \left(\frac{2bd'F_v}{3} \right) \left(\frac{d'}{d} \right)$$

WHERE:

d' = actual depth of beam at the notch.
 d = total depth of beam.

(e) **Design of Eccentric Joints and of Beams Supported by Fastenings.** Eccentric connector and bolted joints, and beams supported by connectors or bolts, shall be designed so that f_v in the following formula does not exceed the allowable unit stresses in horizontal shear.

$$f_v = \frac{3V}{2bd_a}$$

in which

d_a (with
connectors)

= the depth of the member, less the distance from the unloaded edge of the member to the nearest edge of the nearest connector.

d_a (with
bolts
only)

= the depth of the member, less the distance from the unloaded edge of the member to the center of the nearest bolt.

Allowable unit stresses in shear for joints involving bolts or connectors loaded perpendicular to grain, may be fifty percent greater than the horizontal shear values as set forth in Tables 25-A and 25-C, provided the joint occurs at least five times the depth of the member from its end. Where a joint occurs within five times the depth of the member from its end, the strength of the joint shall be evaluated not only for the bolt or connector load, but also as a notched beam, considering the notch to extend from the unloaded edge of the member to the center of the nearest bolt or the nearest edge of the nearest connectors.

(f) **Compression Perpendicular to Grain.** The allowable unit stresses for compression perpendicular to grain, in Tables No.

25-A and No. 25-C apply to bearings of any length at the ends of the beam, and to all bearings 6 inches or more in length at any other location.

For bearings of less than 6 inches in length and not nearer than 3 inches to the end of a member, the maximum allowable load per square inch may be obtained by multiplying the allowable unit stresses in compression perpendicular to grain by the following factor:

$$\frac{l_b + .375}{l_b}$$

in which l_b is the length of bearing in inches measured along the grain of the wood.

The multiplying factors for indicated lengths of bearing on such small areas as plates and washers may be:

LENGTH OF BEARING (In Inches)							
	½	1	1½	2	3	4	6 OR MORE
Factor	1.75	1.38	1.25	1.19	1.13	1.10	1.00

In using the preceding formula and table for round washers or bearing areas, use a length equal to the diameter.

In joists supported on a ribbon or ledger board and spiked to the studding, the allowable stress in compression perpendicular to grain may be increased 50 percent.

(g) **Lateral Support. 1. Floor joists.** Floor joists, having a depth to thickness ratio of 6 or more based on nominal dimensions shall be supported laterally by bridging installed at intervals not exceeding 8 feet. Bridging may be omitted at the ends of joists which are nailed or otherwise fastened to framing members which prevent rotation of the joist..

EXCEPTION: Bridging may be omitted on 2 x 12 joists supporting a live load of 40 psf maximum.

2. Beams and roof joists. For solid sawn rectangular beams and roof joists, the following rules, based on nominal dimensions, shall apply to provide lateral restraint:

If the ratio of depth to thickness is 2 to 1, no lateral support is needed.

If the ratio is 3 to 1, the ends shall be held in position.

If the ratio is 4 to 1, the piece shall be held in line as in a well-bolted chord member in a truss.

If the ratio is 5 to 1, one edge shall be held in line.

If the ratio is 6 to 1, the provisions of paragraph 1 may be applied.

If the ratio is 7 to 1, both edges shall be held in line.

If a beam is subject to both flexure and compression parallel to grain, the ratio may be as much as 5 to 1, if one edge is held firmly in line, as by rafters (or by roof joists) and diagonal sheathing. If the dead load is sufficient to induce tension on the underside of the rafters, the ratio for the beams may be 6 to 1.

In lieu of the above provisions, solid sawn rectangular beams and roof joists may be designed for slenderness in accordance with Section 91.2511(d)5.

(h) **Lateral Deflection—Arches and Top Chords of Trusses.** Where roof joists, not purlins, are used between arches or the

top chords of trusses, the depth, rather than the breadth, of the arch or top chord member (compression member) may be taken as its least dimension in determining the l/d . Roof joists shall be placed so that their upper edges are at least $\frac{1}{2}$ inch above the tops of the arch or chord, but also placed low enough to provide adequate lateral support.

When roof joists or planks are placed on top of an arch or top chord of a truss, and are well spiked or otherwise securely fastened to the arch or top chord and to blocking placed between the joists, or when sheathing is nailed properly to the top chord of trussed rafters, the depth of the arch or individual chord members may be used as the least dimension d in determining l/d .

(i) **Size Factor.** The adjustment of allowable unit stress in bending, F_b , is determined by the size factor of Subdivision 91.2511(d)6 shall be applied to sawn lumber beams exceeding 12 inches in depth.

SEC. 91.2507 — COLUMNS

(a) **Column Classifications.** 1. **Simple solid wood columns.** Simple columns consist of a single piece or of pieces properly glued together to form a single member.

2. **Spaced columns, connector joined.** Spaced columns are formed of two or more individual members with their longitudinal axes parallel, separated at the ends and middle points of their length by blocking and joined at the ends by timber connectors capable of developing the required shear resistance. See National Design Specification for design.

3. **Built-up columns.** Built-up columns, other than connector-joined spaced columns and glued-laminated columns, shall not be designed as solid columns.

(b) **Limitation on l/d Ratios.** For simple solid columns l/d shall not exceed 50.

For individual members of a spaced column, l/d shall not exceed 80, nor shall l_2/d exceed 40.

(c) **Simple Solid-Column Design.** These formulas for simple solid columns are based on pin-end conditions but shall be applied also to square-end conditions.

Allowable unit stresses in pounds per square inch of cross-sectional area of simple solid columns shall be determined by the following formula, but such unit stresses shall not exceed the values for compression, parallel to grain F_c in Tables No. 25-A and No. 25-C, adjusted in accordance with the provisions of Section 91.2504.

$$F'_c = \frac{\pi^2 E}{2.727(l/r)^2} = \frac{3.619E}{(l/r)^2}$$

For columns of square or rectangular cross section this formula becomes:

$$F'_c = \frac{0.30E}{(l/d)^2}$$

(d) **Tapered Columns.** In determining the d for tapered column design, the diameter of a round column or the least dimension of a column of rectangular section, tapered at one or both ends, shall be taken as the sum of the minimum diameter or least dimension and one-third the difference between the minimum and maximum diameters or lesser dimensions.

SEC. 91.2508 — COMBINED FLEXURAL AND AXIAL STRESSES

(a) **Flexure and Axial Tension.** Members subjected to both flexure and axial tension, shall be so proportioned that

$$\frac{P/A}{F_t} + \frac{M/S}{F_b} \text{ does not exceed ONE}$$

(b) **Flexure and Axial Compression.** Members subjected to both flexure and axial compression, shall be so proportioned that

$$\frac{P/A}{F'_c} + \frac{M/S}{F_b} \text{ does not exceed ONE}$$

(c) **Spaced Columns.** In the case of spaced columns, this combined stress formula may be applied only if the bending is in a direction parallel to the greater d of the individual member.

SEC. 91.2509 — OBLIQUE COMPRESSION

The allowable unit stress in compression at an angle of load to grain between 0° and 90° shall be computed from the Hankinson formula as follows:

$$F_n = \frac{F_c F_{c\perp}}{F_c \sin^2 \theta + F_{c\perp} \cos^2 \theta}$$

SEC. 91.2510 — CONNECTORS AND FASTENINGS

(a) **Timber Connectors.** Timber connectors may be used to transmit stress between wood members and between wood and metal members. The design, allowable loads, spacing and installation of timber connectors shall be as set forth in National Design Specification.

Safe loads and design practices for types of connectors not mentioned or fully covered in this Section shall be determined in a manner acceptable to the Department.

(b) **Bolts.** Bolted joints wherein bolts are used to resist or transfer stresses in wood structures shall be designed in accordance with the provisions set forth in National Design Specification.

The location and spacings of bolts shall meet the limitations set forth in Table No. 25-F and the installation of bolts shall be as set forth in National Design Specification.

(c) **Drift Bolts or Pins.** Connections of wood structural members involving the use of drift bolts or drift pins shall be designed in accordance with the provisions set forth in National Design Specification.

The location, spacings and installation of drift bolts or pins shall be as set forth in National Design Specification.

(d) **Wood Screws.** Connections involving the use of wood screws shall be designed in accordance with the provisions set forth in National Design Specification.

Wood screws inserted parallel to the grain of the wood shall not be allowed for resisting withdrawal forces.

The location, spacings and installation of wood screws shall be as set forth in National Design Specification.

(e) **Lag Screws.** Connections involving the use of lag screws shall be designed in accordance with the provisions set forth in National Design Specification.

Lag Screws inserted parallel to the grain of the wood shall

not be allowed for resisting withdrawal forces except as approved by the Department where other connections are not practical.

The location and spacings of lag screws shall meet the limitations set forth in Table No. 25-F and the installation of lag screws shall be as set forth in National Design Specification.

Lag screws which are designed to resist loads exceeding 50 percent of the allowable loads shown in the National Design Specification shall be installed:

- (1) In the shop of an approved Fabricator Type 1 or;
- (2) Under continuous inspection by an approved testing agency which will certify to the installation or;
- (3) Under other conditions specifically approved by the Department.

(f) **Nails and Spikes.** 1. **Safe lateral strength.** A common wire nail driven perpendicular to grain of the wood, when used to fasten wood members together, shall not be subjected to a greater load causing shear and bending than the safe lateral strength of the wire nail or spike as set forth in National Design Specification.

The lateral strength of box wire nails shall not exceed three-fourths of the values for common wire nails.

A wire nail driven parallel to the grain of the wood or toenailed shall not be subjected to more than two-thirds of the lateral load allowed when driven perpendicular to grain.

2. **Safe resistance to withdrawal.** A common wire nail driven perpendicular to grain of the wood shall not be subjected to a greater load, tending to cause withdrawal, than the safe resistance of the nail to withdrawal, as set forth in National Design Specification.

Nails driven parallel to grain of the wood shall not be allowed for resisting withdrawal forces.

3. **Spacing and penetration.** Common wire nails shall have penetration into the piece receiving the point as set forth in National Design Specification. Nails or spikes for which the wire gauges or lengths are not in the Specification shall have a required penetration and allowable loads interpolated.

For wood to wood joints the spacing center-to-center shall be not less than the required penetration.

Edge and end distances shall be not less than one-half of the required penetration where full allowable nail load is directed toward, and perpendicular to, the critical edge or end.

4. **Predrilled holes.** Holes for nails, where necessary to prevent splitting, shall be bored of a diameter not exceeding three-fourths the diameter of the nail or spike.

5. **Split wood.** Nails, when causing a split in the wood, shall not be presumed to resist any load.

(g) **Joist Hangers and Framing Anchors.** Connections depending upon joist hangers or framing anchors, ties, and other mechanical fastenings not otherwise covered may be used where approved by the Department.

(h) **Metal Plate Connector.** Metal plate connector employed as joint connector in light wood trusses shall conform to approvals issued by the Department.

SEC. 91.2511 — GLUED-LAMINATED TIMBER

(a) **General Provisions.** 1. **Design requirements.** Except as otherwise provided in this Section, structural glued-laminated

timber members shall be designed in accordance with the applicable engineering formulas used for sawn members.

2. Fastenings. The pertinent provisions and allowable loads for fastenings given in this Division shall apply to structural glued-laminated timber members.

3. Allowable unit stresses. The allowable unit stresses for structural glued-laminated timber shall be in accordance with Table No. 25-C as modified by this Section.

Structural glued-laminated timber of species not tabulated in this Division will be approved by the Department provided the members and design stresses conform to all applicable provisions of AITC 117 or AITC 120 Standards.

(b) Member Sizes. The finished width, depth (or depths) and length of all straight or curved laminated members, and the location of all points of bearing, shall be detailed on the plans.

(c) Specifications. For structural glued-laminated timber, the following shall be specified on the plans:

Whether for dry or wet conditions of use.

Species and applicable standard (AITC).

Stress requirements and combination symbol.

If the temperature of the timber exceeds 150°F. in service.

(d) Design Stresses. 1. **Dry conditions of use.** Allowable stress values for dry conditions of use shall be applicable for normal loading when the moisture content in service is less than 16 percent, as in most covered structures.

2. **Wet conditions of use.** Allowable stress values for wet conditions of use shall be applicable for normal loading when the moisture content in service is 16 percent or more, as may occur in exterior and submerged construction, and in special building uses.

3. Curvature factor. For the curved portion of members, the allowable unit stress in bending shall be modified by multiplication by the following curvature factor:

$$C_c = 1-2000 \left(\frac{t}{R} \right)^2$$

in which

t = thickness of lamination in inches.

R = radius of curvature of inside face of lamination in inches, and t/R shall not exceed 1/125 for Douglas Fir, Larch, Redwood or Hem-fir. Other species, see AITC Specifications.

No curvature factor shall be applied to stress in the straight portion of an assembly, regardless of curvature elsewhere.

4. Radial tension or compression. The maximum radial stress induced in a curved member of constant rectangular cross section by a bending moment is:

$$f_r = \frac{3M}{2Rbd}$$

in which

f_r = radial stress in pounds per square inch.

M = bending moment in inch pounds.

R = radius of curvature at center line of member in inches.

b = width of cross section in inches.

d = depth of cross section in inches.

The maximum radial stress induced in a curved member of

varying cross section shall be determined as in the National Design Specification.

When M is in the direction tending to decrease curvature (increase the radius), the radial stress is in tension. For Douglas Fir and Larch, the radial tension stress shall not exceed one-third the allowable stress for horizontal shear for wind or earthquake loads, nor 15 pounds per square inch for other types of load. For other species of wood, the radial tension stress shall not exceed one-third the allowable stress for horizontal shear. Where mechanical reinforcement is designed and installed to resist all radial tension stress, the foregoing limits do not apply.

The radial tension stress limitation for Douglas Fir is applicable to the Douglas Fir and Hem-Fir combinations of Table No. 25-C-1 and also to Douglas Fir and to Douglas Fir & Hem-Fir Combined in Table No. 25-C-2.

When M is in the direction tending to increase curvature (decrease the radius) the radial stress is in compression and shall be limited to the allowable stress in compression perpendicular to the grain.

5. Slenderness factor for beams. When the depth of a beam exceeds its breadth, lateral support is required and the slenderness factor shall be calculated by the following formula:

$$C_s = \sqrt{\frac{l_e d}{b^2}}$$

in which

- C_s = slenderness factor.
- l_e = effective length of beam, inches, from table in this subdivision.
- l_u = unsupported length of beam, inches.
- d = depth of beam, inches.
- b = breadth of beam, inches.

When the compression edge of a beam is supported throughout its length to prevent its lateral displacement, and the ends at points of bearing have lateral support to prevent rotation, the unsupported length l_u may be taken as zero.

When lateral support is provided to prevent rotation at the points of end bearing, but no other lateral support is provided throughout the length of the beam, the unsupported length l_u is the distance between such points of end bearing, or the length of a cantilever.

When a beam is provided with lateral support to prevent rotational and lateral displacement at intermediate points as well as at the ends, the unsupported length l_u is the distance between such points of intermediate lateral support.

EFFECTIVE LENGTH OF GLUED-LAMINATED BEAMS

TYPE OF BEAM SPAN AND NATURE OF LOAD	VALUE OF EFFECTIVE LENGTH, l_e
Single span beam, load concentrated at center	1.61 l_u
Single span beam, uniformly distributed load	1.92 l_u
Single span beam, equal end moments	1.84 l_u
Cantilever beam, load concentrated at unsupported end	1.69 l_u
Cantilever beam, uniformly distributed load	1.06 l_u
Single span or cantilever beam, any load	1.92 l_u

When the slenderness factor C_s does not exceed 10, the full allowable unit stress in bending, F_b , may be used.

When the slenderness factor C_s is greater than 10, but does not exceed C_k , the allowable unit stress in bending F'_b shall be determined from the following formula:

$$F'_b = F_b \left[1 - \frac{1}{3} \left(\frac{C_s}{C_k} \right)^4 \right]$$

in which

$$C_k = \sqrt{3E/5F_b}$$

E = modulus of elasticity.

When the slenderness factor C_s is greater than C_k , but less than 50, the allowable unit stress in bending F'_b shall be determined by the following formula:

$$F'_b = \frac{0.40E}{(C_s)^2}$$

In no case shall C_s exceed 50.

6. Size factor for beams. When the depth of a rectangular beam exceeds 12 inches, the allowable unit stress in bending F_b shall be multiplied by the size factor determined by the following formula:

$$C_F = \left(\frac{12}{d} \right)^{1/4}$$

in which

$$C_F = \text{size factor.}$$

$$d = \text{depth of beam in inches.}$$

Depth (in.)	C_F	Depth (in.)	C_F
12	1.00	48	0.86
18	0.96	54	0.85
24	0.93	60	0.84
30	0.90	66	0.83
36	0.88	72	0.82
42	0.87	78	0.81

The size factor shown is based upon a simply supported, uniformly loaded beam with a span to depth ratio of 21. When other loadings or ratios are used, the size factor, C_F , may be modified as shown (straight line interpolation may be used).

Span to Depth Ratios	Percentage change in C_F
7	+6.3
14	+2.3
21	0
28	-1.6
35	-2.8
Loading Condition for Simply Supported Beams	
Single load, any position	+7.8
Uniform load	0
Third-point loads	-3.2

For continuous beams or beams cantilevered over one or both supports, determine the equivalent size factor by assuming the member to be simply supported over the span between actual supports and with a uniformly distributed load.

7. Combined slenderness and size factors. Adjustment of bending stress for size factor is not cumulative with adjustment for slenderness factor.

(e) **Tapered Faces.** No sawn tapered cuts shall be permitted on the tension face of any simple beam. Pitched or curved beams shall be so fabricated that the laminations are parallel to the tension face. Straight, pitched or curved beams may have sawn tapered cuts on the compression face.

For other members subject to bending, the slope of tapered faces, measured from the tangent to the lamination of the section under consideration, shall be not steeper than 1:24 on the tension side.

EXCEPTIONS: 1. *This requirement shall not apply to arches.*

2. *Taper may be steeper at sections increased in size beyond design requirements for architectural projections.*

(f) **Fabrication.** The fabrication of structural glued-laminated timber shall be done in the shop of an approved Type I fabricator and in accordance with Product Standard PS-56.

The fabricator shall provide a signed certification to the Department for every glued-laminated member. The certificate shall include a statement attesting that the member conforms to Product Standard PS-56 and all applicable provisions of this Section, and shall also include the following information:

1. Name and address of approved fabricator
2. Address of installation job site
3. Species of lumber
4. Type of glue
5. Combination symbol, number of laminations, and AITC specification designation
6. Special information—such as
 - a. grade of tension or compression laminations in 20F(4-8) and 22F(4-10)
 - b. slope of grain in all laminations if full tension member
 - c. If to be chemically treated after fabrication
 - d. any special specifications

Every member shall bear the fabricators identification corresponding to the certification.

(g) **Core tests.** Whenever there is reasonable indication that any glued construction does not conform to this Code, the Department may require core tests be made before approving the work. Such tests shall be made without expense to the City.

Tests shall be made as designated by the Department and shall consist of cylindrical specimens, one inch in diameter, cut from the member and tested for shear resistance through the glue lines. The criteria for acceptance shall be those required for the block shear (face joint bonding) test specified in Product Standard PS-56.

SEC. 91.2512 — FORM FACTOR

The allowable unit flexural stresses in nonprismatic members shall not exceed the value established by multiplying such stress by the form factor determined as follows:

Beam Section	Form Factor (C_f)
Circular	1.180
Square (with diagonal vertical)	1.414
Lumber I and Box Beams	$0.81 + C_g (C_d - .81)$

WHERE: C_f = form factor. C_d = depth factor determined in accordance with

$$C_d = 0.81 \frac{(d^2 + 143)}{(d^2 + 88)}$$

 C_g = support factor = $p^2 (6 - 8p + 3p^2) (1 - q) + q$. p = ratio of depth of compression flange to full depth of beam. q = ratio of thickness of web or webs to the full width of beam.**SEC. 91.2513 — GLUED BUILT-UP MEMBERS**

Glued built-up components shall be designed in accordance with well established engineering principles. Fabrication shall be done in the shop of an approved Type I fabricator.

SEC. 91.2514 — WOOD DIAPHRAGMS AND SHEAR WALLS

(a) General. Lumber and plywood diaphragms may be used to resist horizontal forces in horizontal and vertical distributing or resisting elements, provided the deflection in the plane of the diaphragm, as determined by calculations, tests, or analogies drawn therefrom, does not exceed the permissible deflection of attached distributing or resisting elements.

Wood diaphragms and shear walls shall be considered flexible in the distribution of loads. The maximum distance between resisting elements of horizontal diaphragms shall not exceed 200 feet for plywood with blocking, 150 feet for special double diagonal sheathing, 75 feet for plywood without blocking, and 75 feet for diagonal sheathing, unless evidence is submitted for approval by the Superintendent of Building illustrating that no hazard would result from deflections.

Permissible deflection shall be that deflection up to which the diaphragm and any attached distributing or resisting element will maintain its structural integrity under assumed load conditions (i.e. continue to support assumed loads without danger to occupants of the structure).

Connections and anchorages capable of resisting the design forces shall be provided between the diaphragms and the resisting elements. Openings in diaphragms which materially affect their strength shall be fully detailed on the plans, and shall have their edges adequately reinforced to transfer all shearing stresses. Flanges shall be provided at all margins of diaphragms and shear walls.

The shape of diaphragms shall be limited as set forth in Table No. 25-I.

In masonry or concrete buildings, lumber and plywood diaphragms shall not be considered as transmitting lateral forces by rotation. In wood buildings rotation will be permitted as established in rules adopted by the Superintendent of Building.

(b) Diagonally Sheathed Diaphragms. 1. Conventional construction. Such lumber diaphragms shall be made up of 1-inch nominal sheathing boards laid at an angle of approximately 45 degrees to supports. Sheathing boards shall be directly nailed to each intermediate bearing member with not less than two

8d nails for 1-inch by 6-inch nominal boards and three 8d nails for boards 8 inches, or wider; and in addition three 8d nails and four 8d nails shall be used for 6-inch and 8-inch boards, respectively, at the diaphragm boundaries. End joints in adjacent boards shall be separated by at least one joist or stud space, and there shall be at least two boards between joints on the same support. Boundary members at edges of diaphragms shall be designed to resist direct tensile or compressive chord stresses and shall be adequately tied together at corners.

Diaphragm sheathing connectors shall be driven flush but shall not fracture the sheathing. Approved connectors used at diaphragm boundaries and other lines of shear transfer shall provide shear, pull-out and pull-through resistance at least equal to that provided by the nails specified in this Code for the materials to be connected.

Conventional lumber diaphragms may be used to resist shear, due to wind or seismic forces, not exceeding 300 pounds per lineal foot of width.

2. Special construction. Special diagonally sheathed diaphragms shall conform to conventional construction above and in addition, shall have all elements designed in conformance with the provisions of this subdivision.

Each chord or portion thereof may be considered as a beam loaded with a uniform load per foot equal to 50 percent of the unit shear due to diaphragm action. The load shall be assumed as acting normal to the chord, in the plane of the diaphragm and either toward or away from the diaphragm. The span of the chord, or portion thereof, shall be the distance between structural members of the diaphragm such as the joists, studs, and blocking, which serve to transfer the assumed load to the sheathing.

Special diagonally sheathed diaphragms shall include conventional diaphragms sheathed with two layers of diagonal sheathing at 90 degrees to each other and on the same face of the supporting members. Nails in the top layer of sheathing shall be 12d minimum and diaphragm boundary members shall provide a three inch nailing surface.

Special diagonally sheathed diaphragms may be used to resist shears, due to wind or seismic loads, provided such shears do not stress the nails beyond their allowable safe lateral strength and do not exceed 600 pounds per lineal foot of width.

(c) **Plywood Diaphragms.** Horizontal diaphragms and shear walls (vertical diaphragms) sheathed with plywood may be used to resist shear stresses not exceeding those set forth in Table No. 25-J. Plywood for horizontal diaphragms shall be as set forth in Table No. 48-H for corresponding joist spacing and loads. Maximum spans for plywood subfloor-underlayment shall be as set forth in Tables No. 48-H or No. 48-HH. The minimum thickness of plywood in shear walls shall be as set forth in Table No. 25-M. Plywood used for horizontal diaphragms or shear walls shall conform to Product Standard PS-1 and shall be bonded by exterior glue.

All boundary members shall be proportioned and spliced where necessary to transmit direct stresses. Framing members shall be at least 2-inch nominal in the dimension to which the plywood is attached. In general, panel edges shall bear on the framing members and butt along their center lines. Nails shall be placed not less than $\frac{3}{8}$ inch in from the panel edge, nor more than 12 inches apart along intermediate supports and 6 inches along panel edge bearings, and shall be firmly driven into the framing members. No portion of panels less than 24 inches wide shall be installed where nail spacings of less than six inches are required.

EXCEPTIONS: 1. On roof diaphragms, 3-inch minimum width plywood cleats may be used at the unsupported edge of the plywood panel with flat head wood screws spaced at the same interval as the nails; and three additional nails at the panel edge shall be provided at each intermediate support. For $\frac{3}{8}$ -inch plywood, the wood screw shall be #8 with a minimum penetration of $\frac{1}{4}$ -inch into the cleat which shall have a minimum thickness of $\frac{3}{4}$ -inch. For $\frac{1}{2}$ -inch or $\frac{5}{8}$ -inch plywood, the wood screws shall be #10 with a minimum penetration of $\frac{3}{4}$ -inch into cleat of $\frac{3}{4}$ -inch minimum thickness.

2. In lieu of blocking, the tongue ($\frac{1}{8}$ " wide) and groove edges of $1\frac{1}{8}$ " plywood may be fastened with 16 gauge, 1" x $\frac{3}{8}$ " crown staples spaced at one-half the spacing of the diaphragm boundary nailing. Staples shall be $\frac{3}{8}$ " from joint and shall penetrate the tongue.

Diaphragm sheathing connectors shall be driven flush but shall not fracture the plywood. Approved connectors used at diaphragm boundaries and other lines of shear transfer shall provide shear, pull-out and pull-through resistance at least equal to that provided by the nails specified in this Code for the materials to be connected.

SEC. 91.2515 — SHEAR WALL COVERINGS OF OTHER THAN WOOD

Wood stud shear walls may be covered with diaphragm materials conforming to this section.

(a) **Fiberboard.** Walls sheathed with fiberboard sheathing complying with ASTM C208, or ASTM D2277 may be used to resist horizontal forces not exceeding those set forth in Table No. 25-N. The fiberboard panels, 4 feet by 8 feet, shall be applied vertically to wood studs spaced at 16 inches on centers. Two-inch nominal blocking shall be provided at horizontal joints. Nails shall be spaced not less than $\frac{3}{4}$ inch from edges and ends of panels. The diaphragm height-width ratio shall be limited as set forth in Table No. 25-I. Portions of diaphragms exceeding the limiting ratio shall not be considered for structural purposes.

(b) **Gypsum-lath and plaster, sheathing or wallboard.**

Gypsum lath and plaster, gypsum sheathing board and gypsum wallboard, when fastened directly to wood studs, may be used for vertical diaphragms to resist horizontal forces not exceeding those set forth in Table No. 25-N. The shear values shown shall not be cumulative with other materials applied to the same wall.

Framing for gypsum diaphragms shall comply with 91.4814 for bearing walls, and studs shall be spaced not further apart than 16 inches on centers. Marginal studs and plates of shear resisting elements shall be adequately anchored to resist all design forces. Where required in Table No. 25-N, blocking having the same cross-sectional dimensions as the studs shall be provided at all joints that are perpendicular to the studs. The diaphragm height to width ratio shall be limited as set forth in Table No. 25-I. Portions of diaphragms exceeding the limiting ratio shall not be considered for structural purposes.

The size and spacing of nails shall be as set forth in Table No. 25-N. End joints of adjacent courses of gypsum lath, sheathing or wallboard sheets shall not occur over the same stud. Installation shall otherwise comply to Division 47.

(c) **Cement plaster — metal reinforced.** Wood stud walls covered with portland cement plaster or portland cement-lime plaster, when applied over expanded metal or welded or woven wire fabric lath conforming to Division 47 may be used for

vertical diaphragms to resist horizontal forces not exceeding the shear value set forth in Table No. 25-N. The diaphragm height to width ratio shall be limited as set forth in Table No. 25-I. Portions of diaphragms exceeding the limiting ratio shall not be considered for structural purposes.

Wall framing shall comply with 91.4814 for bearing walls, and marginal studs and plates shall be adequately anchored to resist all design forces. The reinforcement and cement plaster shall comply with the provisions of Division 47 and the reinforcement shall be anchored along top and bottom wall plates as required by Table No. 25-N.

SEC. 91.2516 — LIMITATIONS ON WOOD COMBINED WITH MASONRY OR CONCRETE

(a) **Dead Load.** The provisions of Subsection 91.2308(a) are applicable.

(b) **Horizontal Forces.** The provisions of Subsection 91.2308(b) are applicable.

➤ (c) **Wood Diaphragms Laterally Supporting Concrete or Masonry Walls.** Where wood diaphragms are used to laterally support concrete or masonry walls, the wall anchorage shall conform to Subsection 91.2306(b). Anchorage shall not be accomplished by use of toenails or nails subjected to withdrawal and wood ledgers shall not be used in cross grain bending. The continuous ties required by Subdivision 5 of Subsection 91.2305(k) shall be in addition to the diaphragm sheathing and the diaphragm sheathing shall not be used to splice the continuous ties. ◀

SEC. 91.2517 — GENERAL CONSTRUCTION REQUIREMENTS

(a) **General.** The requirements in this Section apply to all wood frame construction.

(b) **Preparation of Building Site.** All stumps and roots shall be removed from the soil to a depth of at least 12 inches below the surface of the ground in the area to be occupied by the building.

All wood forms which have been used in placing concrete, if within the ground or between foundation sills and the ground, shall be removed before a building is occupied or used for any purpose. Before completion, loose or casual wood shall be removed from direct contact with the ground under the building.

(c) **Protection against Decay and Termites.** 1. Wood embedded in ground or concrete. Wood embedded in the ground or in direct contact with the earth and used for the support of permanent structures, shall be treated wood unless continuously below the ground waterline or continuously submerged in fresh water. The treatment of wood embedded in or in contact with the ground shall meet the special requirements of Division 31 for use in such locations.

Wood used structurally in permanent structures and embedded in concrete or masonry shall meet the requirements of Division 31 for use in such locations.

2. **Underfloor clearance.** Wood joists or wood floors closer than 18 inches, or wood girders and supports closer than 12 inches to the ground underfloor surface shall be of treated wood or durable wood.

Accessible underfloor areas shall be provided with an 18-inch high by 24-inch access crawl hole.

3. **Plates, sills and sleepers.** All foundation plates or sills and sleepers on a concrete or masonry slab which is in direct contact with earth, and sills which rest on concrete or masonry foundations, shall be treated wood or durable wood.

EXCEPTIONS: 1. If 48 inches or more from the nearest ground, wood in contact with masonry or concrete need not be treated or durable wood.

2. Exterior siding or sheathing may be painted on the back with two coats of any preservative acceptable for use in treated wood.

4. Columns and posts. All wood columns and posts shall have their location and installation designed to protect their bases from deterioration. In areas exposed to water splash and in exterior locations, wood columns and posts shall be supported by piers projecting at least 2 inches above the finished floor and shall bear on a metal base plate or a foundation plate or sill as specified in Subdivision 3. Posts or columns of treated wood or of durable wood may be placed directly on concrete, solid masonry or grouted masonry.

5. Girders entering masonry or concrete walls. Ends of wood girders entering masonry or concrete walls shall be provided with a 1/2-inch air space on tops, sides and ends unless durable wood or treated wood is used.

6. Foundation ventilation. Underfloor areas shall be ventilated by an approved mechanical means or by openings in the foundation walls as specified in Section 91.4809.

7. Wood and earth separation. No wood, unless preservatively treated for ground contact according to the provisions of Division 31, shall be nearer than 6 inches to any earth unless separated by concrete at least 3 inches in thickness with an impervious membrane installed between the earth and concrete.

Planter boxes installed adjacent to wood frame walls shall comply to Section 91.4809.

(d) Vertical Framing. The framing of exterior and interior walls shall be in accordance with provisions specified in Division 48 unless a specific design is furnished.

All wood columns and posts shall be framed to full end bearings and supports shall be designed to hold the column or post securely in position.

(e) Horizontal Framing. Wood-joisted floors and roofs shall be framed according to the design and shall be anchored to walls as specified in Division 23.

Wood joist, beam, girder, truss, or trussed rafter systems shall be tied continuously across the building from exterior wall to exterior wall. Ties shall transmit all design loads but not less than a force of 200 pounds per linear foot of wall applied in the plane of the floor or roof. Wood, steel, or sheathing materials may be used to form tie splices to provide continuity of required ties across the building.

In wood frame floor construction where suspended ceilings occur, the space between the ceiling and the floor above shall be divided into areas not exceeding 1000 square feet in a manner required for partitioning attic space in Division 32.

(f) Firestopping. Firestopping shall be provided to cut off all concealed draft openings (both vertical and horizontal) and shall form an effective barrier between stories, and between a top story and roof space. It shall be used in specific locations, as specified in Section 91.4815.

(g) Exterior Wall Coverings. 1. General. Exterior wood stud walls shall be covered on the outside with the materials and in the manner specified in 91.4819 or elsewhere in this Code. Studs or sheathing shall be covered on the outside face with a weather resistive barrier except in the following cases:

1. When exterior covering is of approved weatherproof panels.
2. In back-plastered construction.
3. When there is no human occupancy.
4. Over water-repellent panel sheathing.
5. Under approved paperbacked metal or wire fabric lath.

(h) **Structural Floor Sheathing.** Structural floor sheathing shall be designed in accordance with the general provisions of this Code and the special provisions in this Subsection.

Sheathing used as subflooring shall be designed to support all loads specified in this Code and shall be capable of supporting concentrated loads of not less than 300 pounds without failure. The concentrated load shall be applied by a loaded disc, 3 inches or smaller in diameter.

Flooring, including the finish floor, underlayment and sub-floor, where used, shall meet the following requirements:

Deflection under uniform design load limited to $1/360$ of the span between supporting joists or beams.

Deflection of flooring relative to joists under a 1-inch diameter concentrated load of 200 pounds limited to 0.125 inch or less when loaded midway between supporting joists or beams not over 24 inches on center and $1/360$ of the span for spans over 24 inches.

Floor sheathing conforming to the provisions of Tables No. 48-H, 48-IH, 48-I or 48-N shall be deemed to meet the requirements of this Subsection. Board sheathing shall be covered with finish flooring or overlay capable of distributing the floor loads.

Plywood floor sheathing shall be bonded by exterior glue.

(i) **Structural Roof Sheathing.** Structural roof sheathing shall be designed in accordance with the general provisions of this Code and the special provisions in this Subsection. Structural roof sheathing shall be designed to support all loads specified in this Code and shall be capable of supporting concentrated loads of not less than 300 pounds without failure. The concentrated load shall be applied by a loaded disc, 3 inches or smaller in diameter. Structural roof sheathing shall meet the following requirement:

Deflection under uniform design live and dead load limited to $1/180$ of the span between supporting rafters or beams and $1/240$ under live load only.

Roof sheathing conforming to the provisions of Table No. 48-H, 48-I, or No. 48-N shall be deemed to meet the requirements of this Subsection.

Plywood roof sheathing shall be bonded by exterior glue.

Plywood floor sheathing shall be bonded by exterior glue.

(j) **Fastenings.** 1. **Nailing requirements.** The number and size of nails connecting wood members shall be not less than that set forth in Table No. 48-C. Other connections shall be fastened so as to provide equivalent strength. End and edge distances and nail penetrations shall be in accordance with the applicable provisions of 91.2510.

2. **Joist hangers and framing anchors.** Connections depending upon joist hangers or framing anchors, ties and other mechanical fastenings not otherwise covered may be used where approved by the Department.

(k) **Water Splash.** Where wood frame walls and partitions are covered on the interior with plaster, tile or similar materials and are subject to water splash, the framing shall be protected with approved waterproof paper.

(1) **Mechanically Laminated Floors and Decks.** A laminated lumber floor or deck built up of wood members set on edge, when meeting the following requirements may be designed as a solid floor or roof deck of the same thickness, and continuous spans may be designed on the basis of the full cross section using the simple span moment coefficient.

Nail length shall be not less than two and one-half times the net thickness of each lamination. When deck supports are 4 feet on center or less, side nails shall be spaced not more than 30 inches on center and staggered one-third of the spacing in adjacent laminations. When supports are spaced more than 4 feet on center, side nails shall be spaced not more than 18 inches on center alternately near top and bottom edges, and also staggered one-third of the spacing in adjacent laminations. Two side nails shall be used at each end of butt jointed pieces.

Laminations shall be toe-nailed to supports with 20d or larger common nails. When the supports are 4 feet on center or less, alternate laminations shall be toe-nailed to alternate supports; when supports are spaced more than 4 feet on center, alternate laminations shall be toe-nailed to every support.

A single span deck shall have all laminations full length.

A continuous deck of two spans shall have not more than every fourth lamination spliced within quarter points adjoining supports.

Joints shall be closely butted over supports or staggered across the deck but within the adjoining quarter spans.

No lamination shall be spliced more than twice in any span.

(m) **Post-beam Connections.** Where post and beam or girder construction is used, the design shall be in accordance with the provisions of this Code. Positive connection shall be provided to ensure against uplift and lateral displacement.

SEC. 91.2518 — CONVENTIONAL CONSTRUCTION PROVISIONS

(a) **General.** Conventional, wood-stud and wood joist, light-frame buildings, which are not required to be designed by a professional engineer or architect under the laws of the State of California, may be framed and constructed as provided in Division 48 of this Code. Other construction methods may be used, provided a satisfactory design is submitted showing compliance with other provisions of this Code.

Designed wood-stud walls and partitions may be framed as specified in Division 48, provided loads are not in excess of those allowed by that Division. Cutting, notching and boring of studs shall be in accordance with the limitations of that Division.

1970 LUMBER SIZE CHART (PS-20)

NOMINAL AND MINIMUM-DRESSED SIZES OF BOARDS, DIMENSION, AND TIMBERS (The thicknesses apply to all widths and all widths to all thicknesses)						
ITEM	THICKNESS-INCHES ⁽²⁾			FACE WIDTHS-INCHES ⁽²⁾		
	Nominal	Minimum dressed		Nominal	Minimum dressed	
		Dry ⁽¹⁾	Green ⁽¹⁾		Dry ⁽¹⁾	Green ⁽¹⁾
Boards	1 ⁽⁵⁾	$\frac{3}{4}$	$\frac{35}{16}$	2	1 $\frac{1}{2}$	1 $\frac{1}{8}$
	1 $\frac{1}{4}$	1	1 $\frac{1}{8}$	3	2 $\frac{1}{2}$	2 $\frac{1}{8}$
	1 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{3}{8}$	4	3 $\frac{1}{2}$	3 $\frac{1}{8}$
				5	4 $\frac{1}{2}$	4 $\frac{5}{8}$
				6	5 $\frac{1}{2}$	5 $\frac{5}{8}$
				7	6 $\frac{1}{2}$	6 $\frac{5}{8}$
				8	7 $\frac{1}{2}$	7 $\frac{1}{2}$
				9	8 $\frac{1}{2}$	8 $\frac{1}{2}$
				10	9 $\frac{1}{2}$	9 $\frac{1}{2}$
				11	10 $\frac{1}{2}$	10 $\frac{1}{2}$
				12	11 $\frac{1}{2}$	11 $\frac{1}{2}$
				14	13 $\frac{1}{2}$	13 $\frac{1}{2}$
				16	15 $\frac{1}{2}$	15 $\frac{1}{2}$
Dimension ⁽³⁾	2	1 $\frac{1}{2}$	1 $\frac{1}{8}$	2	1 $\frac{1}{2}$	1 $\frac{1}{8}$
	2 $\frac{1}{2}$	2	2 $\frac{1}{8}$	3	2 $\frac{1}{2}$	2 $\frac{1}{8}$
	3	2 $\frac{1}{2}$	2 $\frac{1}{8}$	4	3 $\frac{1}{2}$	3 $\frac{1}{8}$
	3 $\frac{1}{2}$	3	3 $\frac{1}{8}$	5	4 $\frac{1}{2}$	4 $\frac{5}{8}$
				6	5 $\frac{1}{2}$	5 $\frac{5}{8}$
				8	7 $\frac{1}{2}$	7 $\frac{1}{2}$
				10	9 $\frac{1}{2}$	9 $\frac{1}{2}$
				12	11 $\frac{1}{2}$	11 $\frac{1}{2}$
				14	13 $\frac{1}{2}$	13 $\frac{1}{2}$
				16	15 $\frac{1}{2}$	15 $\frac{1}{2}$
Dimension ⁽³⁾	4	3 $\frac{1}{2}$	3 $\frac{1}{8}$	2	1 $\frac{1}{2}$	1 $\frac{1}{8}$
	4 $\frac{1}{2}$	4	4 $\frac{1}{8}$	3	2 $\frac{1}{2}$	2 $\frac{1}{8}$
				4	3 $\frac{1}{2}$	3 $\frac{1}{8}$
				5	4 $\frac{1}{2}$	4 $\frac{5}{8}$
				6	5 $\frac{1}{2}$	5 $\frac{5}{8}$
				8	7 $\frac{1}{2}$	7 $\frac{1}{2}$
				10	9 $\frac{1}{2}$	9 $\frac{1}{2}$
				12	11 $\frac{1}{2}$	11 $\frac{1}{2}$
				14	—	13 $\frac{1}{2}$
				16	—	15 $\frac{1}{2}$
Timbers ⁽⁴⁾	5 and thicker	—	$\frac{1}{2}$ off	5 and wider	—	$\frac{1}{2}$ off

NOTES:

- (1) "DRY" lumber is lumber which has been seasoned at the time of dressing (surfacing) to a moisture content of 19 percent or less. "GREEN" lumber is lumber having a moisture content in excess of 19 percent at the time of dressing (surfacing).
- (2) Thickness is the smaller of the cross section dimensions and width is the larger.
- (3) Dimension—from 2" to less than 5" in nominal thickness.
- (4) Timbers—Beams and Stringers, and Posts and Timbers. B&S: Thickness—5" or more Width—more than 2" over thickness. P&T: Thickness—5" or more Width—not more than 2" over thickness.
- (5) One-inch nominal boards less than the thickness shown, but not less than $\frac{1}{2}$ " DRY (11/16" GRN), are permitted provided the thickness and condition of seasoning at the time of dressing are clearly shown in the grade stamp.

TABLE NO. 25-A-1 ALLOWABLE UNIT STRESSES—VISUALLY GRADED STRUCTURAL LUMBER

Design sizes—see note 2 and 1970 Lumber Size Chart.

Normal loading—see also Section 91.2504.

Dry conditions of use—see notes 2, 6 & 7.

SPECIES AND COMMERCIAL GRADE	SIZE CLASSIFICATION	ALLOWABLE UNIT STRESSES IN POUNDS PER SQUARE INCH						MODULUS OF ELASTICITY "E"	RULES UNDER WHICH GRADED
		EXTREME FIBER IN BENDING "F _b "		Tension Parallel to Grain "F _t "	Horizontal Shear "F _v " ^a	Compression perpendicular to Grain "F _{c⊥} "	Compression Parallel to Grain "F _c "		
		Engineered Uses (Single Member)	Repetitive-member Uses ¹						
DOUGLAS FIR-LARCH	2" to 4" thick 2" to 4" wide	2400	2800	1400	95	455	1850	1,900,000	WCLIB and WWPA
Dense Select Structural		2100	2400	1200	95	385	1600	1,800,000	
Select Structural		2050	2400	1200	95	455	1450	1,900,000	
Dense No. 1		1750	2050	1050	95	385	1250	1,800,000	
No. 1		1700	1950	1000	95	455	1200	1,700,000	
Dense No. 2		1450	1650	850	95	385	1000	1,700,000	
No. 2		800	925	475	95	385	600	1,500,000	
No. 3									
Construction ²		1050	1200	625	95	385	1150	1,500,000	
Standard ²		600	675	350	95	385	925	1,500,000	
Utility ²	275	325	175	95	385	600	1,500,000		
Studs	800	925	475	95	385	600	1,500,000		
Dense Select Structural	2" to 4" thick 6" and wider	2100	2400	1400	95	455	1650	1,900,000	
Select Structural		1800	2050	1200	95	385	1400	1,800,000	
Dense No. 1		1800	2050	1200	95	455	1450	1,900,000	
No. 1		1500	1750	1000	95	385	1250	1,800,000	
Dense No. 2		1450	1700	950	95	455	1250	1,700,000	
No. 2		1250	1450	825	95	385	1050	1,700,000	
No. 3		725	850	475	95	385	675	1,500,000	

(Continued)

TABLE NO. 25-A-1 (Continued)

SPECIES AND COMMERCIAL GRADE	SIZE CLASSIFICATION	ALLOWABLE UNIT STRESSES IN POUNDS PER SQUARE INCH						MODULUS OF ELASTICITY "E"	RULES UNDER WHICH GRADED
		EXTREME FIBER IN BENDING "F _b "		Tension Parallel to Grain "F _t "	Horizontal Shear "F _v "	Compression perpendicular to Grain "F _{c1} "	Compression Parallel to Grain "F _c "		
		Engineered Uses (Single Member)	Repetitive-member Uses						
Appearance	2" to 4" thick 2" to 4" wide	1750	2050	1050	95	385	1500	1,800,000	WCLIB and WWPA
Appearance	2" to 4" thick 6" and wider	1500	1750	1000	95	385	1500	1,800,000	
Dense Select Structural	Beams and Stringers ¹²	1850 ¹²	—	1100 ¹²	85	455	1300	1,700,000	
Select Structural		1600	—	950 ¹²	85	385	1100	1,600,000	
Dense No. 1		1550	—	775 ¹²	85	455	1100	1,700,000	
No. 1		1350	—	675 ¹²	85	385	925	1,600,000	
Dense Select Structural	Posts and Timbers	1750	—	1150	85	455	1400	1,700,000	
Select Structural		1500	—	1000	85	385	1150 ¹²	1,600,000	
Dense No. 1		1400	—	950	85	455	1200	1,700,000	
No. 1		1200	—	825	85	385	1000	1,600,000	
Select Dex	Decking	1750	2000	—	—	385	—	1,800,000	WCLIB
Commercial Dex		1450	1650	—	—	385	—	1,700,000	

TABLE NO. 25-A-1 (Continued)

Selected Decking Commercial Decking	Decking	—	2150 1800	(Stresses for Decking apply at 15 per cent moisture content)				1,900,000 1,700,000	WWPA
HEM-FIR									
Select Structural	2" to 4"	1650	1900	975	75	245	1300	1,500,000	WCLIB and WWPA
No. 1	thick	1400	1600	825	75	245	1000	1,500,000	
No. 2	2" to 4"	1150	1300	675	75	245	800	1,400,000	
No. 3	wide	625	725	375	75	245	500	1,200,000	
Construction ²	2" to 4"	825	975	475	75	245	925	1,200,000	
Standard ²	thick	450	525	275	75	245	750	1,200,000	
Utility ²	4" wide	225	250	125	75	245	500	1,200,000	
Studs		625	725	375	75	245	500	1,200,000	
Select Structural	2" to 4"	1400	1650	950	75	245	1150	1,500,000	
No. 1	thick	1200	1400	800	75	245	1000	1,500,000	
No. 2	6" and	1000	1150	650	75	245	850	1,400,000	
No. 3	wider	575	675	375	75	245	550	1,200,000	
Appearance	2" to 4" thick 2" to 4" wide	1400	1600	825	75	245	1200	1,500,000	
Appearance	2" to 4" thick 6" and wider	1200	1400	800	75	245	1200	1,500,000	

(Continued)

TABLE NO. 25-A-1 (Continued)

SPECIES AND COMMERCIAL GRADE	SIZE CLASSIFICATION	ALLOWABLE UNIT STRESSES IN POUNDS PER SQUARE INCH						MODULUS OF ELASTICITY "E"	RULES UNDER WHICH GRADED
		EXTREME FIBER IN BENDING "F _b "		Tension Parallel to Grain "F _t "	Horizontal Shear "F _v " ⁸	Compression perpendicular to Grain "F _{c1} "	Compression Parallel to Grain "F _c "		
		Engineered Uses (Single Member)	Repetitive-member Uses ⁽¹⁾						
Select Structural No. 1	Beams and Stringers	1250 1000 ¹²	— —	750 ¹² 525 ¹²	70 70	245 245	900 750 ¹²	1,400,000 1,400,000	WCLIB and WWPA
Select Structural No. 1	Posts and Timbers	1200 975	— —	800 650	70 70	245 245	950 850	1,400,000 1,400,000	
Select Dex, Commercial Dex	Decking	1400 1150	1600 1300	— —	— —	245 245	— —	1,500,000 1,400,000	WCLIB
Selected Decking Commercial Decking	Decking ¹¹	— —	1600 1300	— —	— —	— —	— —	1,500,000 1,400,000	WWPA
Selected Decking Commercial Decking	Decking	— —	1750 1450	(Stresses for Decking apply at 15 per cent moisture content)				1,600,000 1,500,000	

For other species, grades and Grading Rules see
Section 91.2504(a)—National Design Specification.

NOTES ON TABLE NO. 25-A-1

NOTES:

- (1) Repetitive members are visually graded lumber used as joists, rafters, studs or decking; not less than 3 in number; contiguous or spaced not more than 24" o.c.; and joined by a transverse floor or roof or other load distributing element or connection, capable of effecting load transfer to adjacent members.
- (2) The recommended design values shown in Table No. 25-A-1 are applicable to lumber that will be used under dry conditions such as in most covered structures. For 2-inch to 4-inch thick lumber the DRY surfaced size shall be used. (In calculating design values, the natural gain in strength and stiffness that occurs as lumber dries has been taken into consideration as well as the reduction in size that occurs when unseasoned lumber shrinks. The gain in load-carrying capacity due to increased strength and stiffness resulting from drying more than offsets the design effect of size reductions due to shrinkage). For 5-inch and thicker lumber, the surfaced size shall be used because design values have been adjusted to compensate for any loss in size by shrinkage which may occur.
- (3) Values for " F_b ", " F_c ", and " E " for the grades of Construction, Standard and Utility apply only to 4-inch widths.
- (4) The values in Table No. 25-A-1 are based on edgewise use. For dimension 2 inches to 4 inches in thickness, when used flatwise, the recommended design values for fiber stress in bending may be multiplied by the following factors:

WIDTH	THICKNESS		
	2"	3"	4"
2 inches to 4 inches	1.10	1.04	1.00
6 inches and wider	1.22	1.16	1.11

For "Decking" use factors for 2" to 4" width.

- (5) When 2-inch to 4-inch thick lumber is manufactured at a maximum moisture content of 15 per cent and used in a condition where the moisture content does not exceed 15 per cent, the design values shown in Table No. 25-A-1 may be multiplied by the following factors provided the grade stamps include the 15 per cent M.C. at time of manufacture:

EXTREME FIBER IN BENDING " F_b "	TENSION PARALLEL TO GRAIN " F_t "	HORIZONTAL SHEAR " F_v "
1.08	1.08	1.05

COMPRESSION PERPENDICULAR TO GRAIN " $F_{c\perp}$ "	COMPRESSION PARALLEL TO GRAIN " F_c "	MODULUS OF ELASTICITY " E "
1.00	1.17*	1.05*

- (6) When 2-inch to 4-inch thick lumber is designed for use where the moisture content will exceed 19 per cent for an extended period of time, the values shown in Table No. 25-A-1 should be multiplied by the following factors:

EXTREME FIBER IN BENDING " F_b "	TENSION PARALLEL TO GRAIN " F_t "	HORIZONTAL SHEAR " F_v "
0.86	0.84	0.97

COMPRESSION PERPENDICULAR TO GRAIN " $F_{c\perp}$ "	COMPRESSION PARALLEL TO GRAIN " F_c "	MODULUS OF ELASTICITY " E "
0.87	0.70	0.97

- (7) When lumber 5 inches and thicker is designed for use where the moisture content will exceed 19 per cent for an extended period of time, the values shown in Table No. 25-A-1 should be multiplied by the following factors:

EXTREME FIBER IN BENDING " F_b "	TENSION PARALLEL TO GRAIN " F_t "	HORIZONTAL SHEAR " F_v "
1.00	1.00	1.00

COMPRESSION PERPENDICULAR TO GRAIN " $F_{c\perp}$ "	COMPRESSION PARALLEL TO GRAIN " F_c "	MODULUS OF ELASTICITY " E "
0.67	0.91	1.00

(Continued)

NOTES ON TABLE NO. 25-A-1 (Continued)

- (8) The tabulated horizontal shear values shown herein are based on the conservative assumption of the most severe checks, shakes or splits possible, as if a piece were split full length. When lumber 4 inches and thinner is manufactured unseasoned, the tabulated values should be multiplied by a factor of 0.92.

Specific horizontal shear values for a grade and species of lumber may be established by use of the following tables when the length of split or check is known, except Redwood.

WHEN LENGTH OF SPLIT IS:	MULTIPLY TABULATED "F _v " VALUE BY: (NOMINAL 2-INCH LUMBER)
No split	2.00
1/2 x wide face	1.67
3/4 x wide face	1.50
1 x wide face	1.33
1 1/2 x wide face or more	1.00

WHEN LENGTH OF SPLIT ON WIDE FACE IS:	MULTIPLY TABULATED "F _v " VALUE BY: (3-INCH AND THICKER LUMBER)
No split	2.00
1/2 x narrow face	1.67
1 x narrow face	1.33
1 1/2 x narrow face or more	1.00

- (9) Stress rated boards of nominal 1-inch, 1 1/4-inch and 1 1/2-inch thickness, 2 inches and wider are permitted the recommended design values shown for Select Structural, No. 1, Appearance, No. 2 and No. 3 grades as shown in 2 inches to 4 inches thick, 2 inches to 4 inches wide and 2 inches to 4 inches thick, 6-inch and wider categories when graded in accordance with those grade requirements.
- (10) For species combinations shown in parentheses, the lowest design values for any species in the combination are tabulated. White Woods may include Engelmann spruce, any true firs, any hemlock and any pine. Mixed Species may include any western species.
- (11) When Decking is used where the moisture content will exceed 15 per cent for an extended period of time, the tabulated design values should be multiplied by the following factors: Extreme Fiber in Bending F_b —0.79; Modulus of Elasticity E —0.92.
- (12) These allowable stresses are the lesser of the two values shown under the WCLIB and WWPA Grading Rules for B & S and P & T. If, at the time of design, the specific Rules are known and specified, the respective allowable stresses shown in the National Design Specification will be permitted.

TABLE NO. 25-A-2
ALLOWABLE UNIT STRESSES FOR MACHINE
STRESS-RATED LUMBER
Normal Loading—Dry Conditions of Use⁽⁵⁾

GRADE ⁽²⁾ DESIGNATION	SIZE CLASSIFICATION	POUNDS PER SQUARE INCH			
		EXTREME FIBER IN BENDING "F _b " ⁽¹⁾	TENSION PARALLEL TO GRAIN "F _t "	COMPRES- SION PARALLEL TO GRAIN "F _c "	MODULUS OF ELASTICITY "E"
900f-1.0E	Machine Rated Lumber 2" thick or less All widths	900	350	725	1,000,000
1200f-1.2E		1200	600	950	1,200,000
1500f-1.4E		1500	900	1200	1,400,000
1650f-1.5E		1650	1020	1320	1,500,000
1800f-1.6E		1800	1175	1450	1,600,000
2100f-1.8E		2100	1575	1700	1,800,000
2400f-2.0E		2400	1925	1925	2,000,000
2700f-2.2E		2700	2150	2150	2,200,000
3000f-2.4E		3000	2400	2400	2,400,000
3300f-2.6E		3300	2650	2650	2,600,000

Allowable unit stresses in pounds per square inch				
Compression perpendicular to grain F _{c1}				
Douglas Fir-Larch	Hem-Fir	Pine (3)	Englemann Spruce	Cedar (4)
385	245	240	195	295
Horizontal Shear F _v				
Douglas Fir-Larch	Hem-Fir	Pine (3)	Englemann Spruce	Cedar (4)
95	75	65	70	75

NOTES:

- (1) Extreme fiber in bending values F_b are applicable to lumber loaded on edge. When loaded flatwise, these values should be multiplied by the following factors:

NOMINAL WIDTH (Inches)	4	6	8	10	12	14
Factor	1.10	1.15	1.19	1.22	1.25	1.28

- (2) Graded under the 1970 Grading Rules of the West Coast Lumber Inspection Bureau or Western Wood Products Association and conformance to the visual grading requirements of the Grading Rules for MSR lumber is required in addition to the machine grading.
- (3) Includes Idaho White, Lodgepole, Ponderosa or Sugar Pine.
- (4) Includes Incense or Western Red Cedar.
- (5) Tabulated stresses for Stress-Rated Lumber shall only be allowed for dry conditions of use, as in covered structures. Other conditions and reduced design stresses may be permitted when substantiated to, and approved by, the Department.

**TABLE NO. 25-B — ALLOWABLE UNIT STRESSES FOR
SOFTWOOD PLYWOOD
NORMAL DURATION OF LOADING
(POUNDS PER SQUARE INCH)⁽⁶⁾**

Type of Stress	Species Group ⁽¹⁾	Exterior A-A, A-C, C-C ⁽²⁾ Structural I A-C, C-C (Use Group 1 Stresses)	Exterior A-B, B-B, B-C, C-C (Plugged) Structural I C-D (Use Gr. 1 Stresses) Structural II C-D (Use Gr. 3 Stresses) C-D (Exterior Glue) ⁽²⁾ All Interior Grades with Exterior Glue
Extreme Fiber in bending, ⁽³⁾ tension, ⁽³⁾ Face grain parallel or perpendicular to span (at 45° to face grain use 1/6).	1	2,000	1,650
	2,3	1,400	1,200
	4	1,200	1,000
Compression parallel or perpendicular to face grain (at 45° to face grain use 1/5).	1	1,650	1,550
	2,3	1,200	1,100
	4	1,000	950
Bearing (on face).	1	340	340
	2,3	220	220
	4	160	160
Shear in plane perpendicular to plies. ⁽³⁾ Parallel or perpendicular to face grain (at 45° increase 100%).	1	250	250
	2,3	185	185
	4	175	175
Shear, rolling in plane of plies, parallel or perpendicular to face grain (at 45° increase 1/5). ⁽⁴⁾	All	53	53
Modulus of Elasticity in bending. Face grain parallel or perpendicular to span.	1	1,800,000	1,800,000
	2	1,500,000	1,500,000
	3	1,200,000	1,200,000
	4	900,000	900,000

NOTES:

- (1) For Species Group see the U.S. Department of Commerce Product Standard PS-1.
- (2) Exterior C-C and C-D grade: The combination of Identification-Index designation and panel thickness determines the minimum species group and, therefore, the stress permitted, as follows:
5/16 - 20/0, 3/8 - 24/0, 1/2 - 32/16, 5/8 - 42/20, 3/4 - 48/24
— Use Group 2 working stresses.
All other combinations — Use Group 4 working stresses.
- (3) Shear-through-the-thickness stresses are based on the most common structural applications where the plywood is attached to framing around its boundary. Where the plywood is attached to framing at only two sides — such as in the heel joint of a truss — reduce the allowable shear-through-the-thickness values by 11 per cent where framing is parallel to face grain and 25 per cent where it is perpendicular.
- (4) For STRUCTURAL I and STRUCTURAL II use 75 psi and 56 psi, respectively.
- (5) Maximum stress for extreme fibers in bending and tension shall be limited to 75 per cent of the values indicated in this table at scarf joints in plywood.
- (6) Wet or damp location: Where moisture content is 16 per cent or more, decrease the dry location values as follows for all grades of Exterior and Interior plywood with exterior glue: Extreme Fiber in Bending, 25 per cent; Tension, 31 per cent; Compression, 39 per cent; Bearing, 33 per cent; Shear, 16 per cent; Modulus of Elasticity, 11 per cent.

TABLE NO. 25-C-1
PART A — ALLOWABLE UNIT STRESSES FOR STRUCTURAL
GLUED-LAMINATED SOFTWOOD TIMBER FOR NORMAL LOADING
DURATION — VISUALLY GRADED^o

ALLOWABLE UNIT STRESSES IN P.S.I.									
COMBINATION ^a SYMBOL	NUMBER OF LAMINATIONS	EXTREME FIBER IN BENDING (F_b) ^a		TENSION PARALLEL TO GRAIN (F_t)	COMPRESSION PARALLEL TO GRAIN (F_c)	HORIZONTAL SHEAR (F_v) WHEN LOADED:		COMPRESSION PERPENDICULAR TO GRAIN ($F_{c\perp}$)	MODULUS OF ELASTICITY (E)
		Load Parallel to Wide Face of Laminations	Load Perpendicular to Wide Face of Laminations			Parallel to Wide Face	Perpendicular to Wide Face		
1 — DRY CONDITIONS OF USE									
Douglas Fir and Western Larch ^b									
16F ¹	4 or more	—	1600	1300	1500	—	165	385	1,600,000
18F ¹	4 or more	—	1800	1400	1500	—	165	385	1,700,000
20F ¹	4 or more	—	2000	1600	1500	—	165	385 ⁴	1,700,000
22F ¹	4 or more	—	2200	1600	1500	—	165	385 ^{3, 4}	1,800,000
24F ¹	4 or more	—	2400	1600	1500	—	165	385 ³	1,800,000
1 ²	4 or more ⁵	900	1200	1000	1500	145	165	385	1,600,000
2 ²	4 or more ⁵	1500	1800	1400	1800	145	165	385	1,800,000
3 ²	4 or more ⁵	1900	2200	1800	2100	145	165	450	1,900,000
4 ²	4 or more ⁵	2100	2400	1900	2000	145	165	410	2,000,000
5 ²	4 or more ⁵	2300	2600	2100	2200	145	165	450	2,100,000

(Continued)

TABLE NO. 25-C-1 (Continued)
PART A — ALLOWABLE UNIT STRESSES FOR STRUCTURAL
GLUED-LAMINATED SOFTWOOD TIMBER FOR NORMAL LOADING
DURATION — VISUALLY GRADED^a

ALLOWABLE UNIT STRESSES IN P.S.I.										
COMBINATION ^N SYMBOL	NUMBER OF LAMINATIONS	EXTREME FIBER IN BENDING (F _b) ^Q		TENSION PARALLEL TO GRAIN (F _t)	COMPRESSION PARALLEL TO GRAIN (F _c)	HORIZONTAL SHEAR (F _v) WHEN LOADED:		COMPRESSION PERPENDICULAR TO GRAIN (F _{c⊥})	MODULUS OF ELASTICITY (E)	
		Load Parallel to Wide Face of Laminations	Load Perpendicular to Wide Face of Laminations			Parallel to Wide Face	Perpendicular to Wide Face			
1 — DRY CONDITIONS OF USE										
California Redwood ^N										
16F ¹		4 or more	—	1600	1300	1600	—	125	325	1,400,000
22F	1 ¹	4 or more	—	2200	1800	2000	—	125	325	1,400,000
	2 ¹	4 or more	—	2200	1800	2000	—	125	325	1,400,000
	3 ¹	4 or more	—	2200	1800	2200	—	125	325	1,400,000
	1 ²	4 or more ⁵	1000	1400	1100	1800	115	125	325	1,300,000
	2 ²	4 or more ⁵	1000	1400	1100	1800	115	125	325	1,300,000
	3 ²	4 or more ⁵	1400	2000	1600	2000	125	125	325	1,400,000
	4 ²	4 or more ⁵	2200	2200	1800	2200	125	125	325	1,400,000
	5 ²	4 or more ⁵	2200	2200	1800	2200	125	125	325	1,400,000
Hem-Fir ⁸										
18F ¹		4 or more	—	1800	1300	1250	—	155	245	1,600,000
20F ¹		4 or more	—	2000	1300	1250	—	155	245	1,600,000
24F ¹		4 or more	—	2400	1300	1250	—	155	245	1,700,000
	1 ¹	4 or more ¹	700	1000	800	1250	125	155	245	1,300,000
	2 ¹	4 or more ¹	1200	1400	1150	1500	125	155	245	1,400,000
	3 ¹	4 or more ¹	1550	1800	1450	1550	125	155	245	1,600,000
	4 ¹	4 or more ¹	1800	2400	1700	1800	125	155	245	1,700,000

2--WET CONDITIONS OF USE									
Douglas Fir and Western Larch ^a									
16F ¹	4 or more	—	1300	1000	1100	—	145	260	1,300,000
18F ¹	4 or more	—	1400	1100	1100	—	145	260	1,400,000
20F ¹	4 or more	—	1600	1300	1100	—	145	260 ⁴	1,400,000
22F ¹	4 or more	—	1800	1300	1100	—	145	260 ^{3, 4}	1,500,000
24F ¹	4 or more	—	1900	1300	1100	—	145	260 ³	1,500,000
1 ²	4 or more ⁵	750	950	750	1100	120	145	260	1,300,000
2 ²	4 or more ⁵	1100	1400	1100	1300	120	145	260	1,500,000
3 ²	4 or more ⁵	1450	1800	1400	1500	120	145	305	1,600,000
4 ²	4 or more ⁵	1500	1900	1500	1450	120	145	275	1,700,000
5 ²	4 or more ⁵	1600	2000	1600	1600	120	145	305	1,800,000
California Redwood ^a									
16F ¹	4 or more	—	1300	1000	1200	—	110	215	1,200,000
22F ¹	4 or more	—	1800	1400	1500	—	110	215	1,200,000
2 ¹	4 or more	—	1800	1400	1500	—	110	215	1,200,000
3 ¹	4 or more	—	1800	1400	1600	—	110	215	1,200,000
1 ²	4 or more ⁵	800	1100	900	1300	100	110	215	1,100,000
2 ²	4 or more ⁵	800	1100	900	1300	100	110	215	1,100,000
3 ²	4 or more ⁵	1100	1600	1400	1500	110	110	215	1,200,000
4 ²	4 or more ⁵	1800	1800	1400	1600	110	110	215	1,200,000
5 ²	4 or more ⁵	1800	1800	1400	1600	110	110	215	1,200,000

(Continued)

TABLE NO. 25-C-1 (Continued)
PART A — ALLOWABLE UNIT STRESSES FOR STRUCTURAL
GLUED-LAMINATED SOFTWOOD TIMBER FOR NORMAL LOADING
DURATION — VISUALLY GRADED

ALLOWABLE UNIT STRESSES IN P.S.I.									
COMBINATION ⁸ SYMBOL	NUMBER OF LAMINATIONS	EXTREME FIBER IN BENDING (F _b) ¹¹		TENSION PARALLEL TO GRAIN (F _t)	COMPRESSION PARALLEL TO GRAIN (F _c)	HORIZONTAL SHEAR (F _v) WHEN LOADED:		COMPRESSION PERPENDICULAR TO GRAIN (F _{c1})	MODULUS OF ELASTICITY (E) 10
		Load Parallel to Wide Face of Laminations	Load Perpendicular to Wide Face of Laminations			Parallel to Wide Face	Perpendicular to Wide Face		
2—WET CONDITIONS OF USE									
Hem-Fir ⁸									
18F ¹	4 or more	—	1400	1000	900	—	140	165	1,300,000
20F ²	4 or more	—	1600	1000	900	—	140	165	1,300,000
24F ³	4 or more	—	1900	1000	900	—	140	165	1,400,000
1 ¹	4 or more ¹	550	750	600	900	110	140	165	1,100,000
2 ²	4 or more ²	900	1150	900	1100	110	140	165	1,200,000
3 ³	4 or more ³	1150	1450	1150	1150	110	140	165	1,300,000
4 ⁴	4 or more ⁴	1350	1900	1500	1350	110	140	165	1,400,000

NOTES:

- (1) For members stressed principally in bending; load applied perpendicular to the wide face of the laminations.
- (2) For members stressed principally in axial tension, axial compression or in bending with load applied parallel to the wide face of the laminations.
- (3) Values shown are for comp. face. Allowable stress for compression perpendicular to the grain for the tension face is 450 p.s.i. for dry condition of use and 305 p.s.i. for wet condition of use.
- (4) For combinations using an L1-C or an L2-D for outer tension and compression laminations, allowable stress for compression perpendicular to grain is as follows: L1-C, 410 p.s.i. for dry condition of use and 275 p.s.i. for wet condition of use; L2-D, 450 p.s.i. for dry condition of use and 305 p.s.i. for wet condition of use.
- (5) Allowable stresses shown for extreme fiber in bending and horizontal shear when loaded parallel to wide face of lamination and for compression per-

pendicular to grain are applicable to members containing three or more laminations.

- (6) Unit stresses for bending members are based on a depth of members of 12 inches or less. For members greater than 12 inches in depth, the size factor is applicable.
- (7) Allowable stresses shown for extreme fiber in bending and horizontal shear when loaded parallel to wide face of laminations are applicable to members containing three or more laminations.
- (8) Members manufactured to these combinations of Douglas Fir and Western Larch or California Redwood shall conform to all applicable provisions of AITC 117 specifications, and combinations of Hem-Fir shall conform to Supplement No. 2 of AITC 117 specifications.
- (9) In addition to the species in this table, Southern Pine glued timber may be used if designed and manufactured to all applicable provisions of AITC 117 specifications.

TABLE NO. 25-C-1
PART B — ALLOWABLE STRESS INCREASES WITH
SPECIAL SLOPE OF GRAIN LIMITATIONS⁽¹⁾

Douglas Fir and Western Larch					
COMBINATION SYMBOL	TENSION PARALLEL TO GRAIN			COMPRESSION PARALLEL TO GRAIN	
	SLOPE OF GRAIN	ALLOWABLE STRESS INCREASE (per cent)		SLOPE OF GRAIN	ALLOWABLE STRESS INCREASE (per cent)
		10 or Less Laminations	11 or More Laminations		4 or More Laminations
22F	1:14	6	25	1:12	15
24F	1:14	19	30	1:12	20

NOTE:

- (1) When the increases in Part B are used in the design, the required slope of grain for all laminations shall be shown on the plans.

TABLE NO. 25-C-2
ALLOWABLE UNIT STRESSES FOR GLUED-LAMINATED
SOFTWOOD TIMBER FOR NORMAL LOADING DURATION—
VISUALLY GRADED AND "E" RATED (1, 4)

COMBINATION SYMBOL ^{1, 4}	NO. OF LAMINATIONS	EXTREME FIBER IN BENDING F_b	TENSION PARALLEL TO GRAIN F_t	COMPRESSION PARALLEL TO GRAIN F_c	COMPRESSION PERPENDICULAR TO GRAIN $F_{c\perp}$	HORIZONTAL SHEAR F_v	MODULUS OF ELASTICITY E
DRY CONDITIONS OF USE							
Douglas fir							
22F-E	4 or more	2200	1600	1500	450	165	1,800,000
26F-E	4 or more	2600	1600	1500	450	165	2,100,000
Southern pine							
22F-E	4 or more	2200	1600	1500	450	200	1,700,000
26F-E	4 or more	2600	1600	1500	450	200	1,900,000
Hem - Fir							
22F-E	4 or more	2200	1300	1200	245	155	1,600,000
26F-E	4 or more	2600	1300	1200	245	155	1,800,000
Douglas Fir & Hem-Fir Combined²							
26F-E	4 or more	2600	1600	1500	245 ³	165	1,800,000
Lodgepole Pine							
16F-E	4 or more	1600	1100	1000	250	145	1,300,000
20F-E	4 or more	2000	1100	1000	250	145	1,500,000

WET CONDITIONS OF USE

Douglas Fir							
22F-E	4 or more	1800	1300	1100	300	145	1,500,000
26F-E	4 or more	2100	1300	1100	300	145	1,800,000
Southern Pine							
22F-E	4 or more	1800	1300	1100	300	180	1,400,000
26F-E	4 or more	2100	1300	1100	300	180	1,600,000
Hem - Fir							
22F-E	4 or more	1800	1000	900	165	140	1,300,000
26F-E	4 or more	2100	1000	900	165	140	1,500,000
Douglas Fir & Hem-Fir Combined²							
26F-E	4 or more	2100	1300	1100	165 ³	145	1,500,000
Lodgepole Pine							
16F-E	4 or more	1300	900	700	165	130	1,100,000
20F-E	4 or more	1600	900	700	165	130	1,300,000

NOTES:

- (1) For members composed of 4 or more laminations and stressed principally in bending with load perpendicular to wide face of laminations.
- (2) For members greater than 12 inches in depth, the size factor is applicable.
- (3) This combination consists of Hem-Fir in the tension zone ($\frac{1}{4}$ of total depth of the member) and Douglas Fir in the remainder. The tabulated $F_{c\perp}$ value applies to the tension side of the member. The $F_{c\perp}$ on the compression side is 450 psi for dry, and 300 psi for wet, conditions of use.
- (4) Members manufactured to these combinations shall conform to all applicable provisions of AITC 120 specifications.

TABLE 25-E
ALLOWABLE UNIT STRESSES FOR ROUND TIMBER POLES
AND PILES (In p.s.i. and for Normal Duration of Load)

SPECIES	EXTREME FIBER IN BENDING ¹	COMPRESSION PARALLEL TO GRAIN (L/D = 11 OR LESS)	COMPRESSION PERPENDICULAR TO GRAIN	HORIZONTAL SHEAR	AVERAGE MODULUS OF ELASTICITY
Southern Pine	2150	1200	260	130	1,600,000
Douglas Fir (Coast)	2150	1200	260	110	1,600,000
Western Larch	2150	1200	260	110	1,600,000
Red Oak	2000	1100	400	150	1,500,000
Ponderosa Pine	1200	830	200	100	1,000,000
Lodgepole Pine	1200	800	180	80	1,000,000
Red (Norway) Pine	1550	850	180	100	1,200,000

NOTE:

- (1) Extreme fiber in bending values include 18 per cent increase allowed for round shape form factor.

**TABLE NO. 25-F — MINIMUM BOLT AND LAG SCREW
LOCATION REQUIREMENTS**

Spacing or Distance	Number of Bolt Diameters
Between centers of bolts in rows.....	4
Between centers of rows of bolts	
Force parallel to grain.....	1½
Force perpendicular to grain;	
$l/d = 2^{(1)}$	2½
$l/d = 6^{(1)}$ or more.....	5
Rows parallel the member:	
Wood side plates—5 inch maximum unless separate side plates for each row.	
Metal side plates—4 inch maximum unless separate side plates for each row.	
Between end of member and center of bolt for force parallel to grain and acting toward end.....	7
Between end of member and center of bolt for force parallel or perpendicular to grain and not acting toward end.....	4
Between edge of member and center of bolt for force perpendicular or parallel to grain and not acting toward edge.....	1½
Between edge of member and center of bolt for force perpendicular to grain and acting toward edge.....	4

NOTE:

(1) The l/d ratio is the bolt length in the main member to the bolt diameter. Straight line interpolation may be used between l/d of 2 and 6.

**TABLE NO. 25-I — MAXIMUM DIAPHRAGM
DIMENSION RATIOS**

	HORIZONTAL DIAPHRAGMS Maximum Span-Width Ratios	SHEAR WALLS Maximum Height-Width Ratios
1. Diagonal sheathing, conventional	3:1	2:1
2. Diagonal sheathing, special	4:1	3 1/2:1
3. Plywood, nailed all edges	4:1	3 1/2:1
4. Plywood, blocking omitted at intermediate joints	3 1/2:1	
5. Cement plaster on expanded metal or welded or woven wire fabric lath		1 1/2:1
6. Gypsum-lath and plaster or wallboard or sheathing		1 1/2:1
7. Fiberboard sheathing		1 1/2:1

(See next page
for notes to this table)

**TABLE NO. 25-J — ALLOWABLE SHEAR IN POUNDS PER FOOT
FOR PLYWOOD DIAPHRAGMS AND SHEAR WALLS OF WOOD-FRAMED ASSEMBLIES**
Shear Values Are Based on Wind or Seismic Loading⁽²⁾ and Douglas Fir Framing⁽⁵⁾

PLYWOOD GRADE	COMMON NAIL SIZE	MINIMUM NAIL PENETRA- TION INTO FRAMING (inches)	MINIMUM NOMINAL PLYWOOD THICKNESS (inches)	MINIMUM NOMINAL WIDTH OF FRAMING MEMBER (inches)	BLOCKED DIAPHRAGMS AND SHEAR WALLS ⁽³⁾				UNBLOCKED HORIZONTAL DIAPHRAGMS Nails Spaced at 6" o.c. Along Supported Edges
					Nail Spacing at All Diaphragm and Wall Boundaries and at Continuous Panel Edges Parallel to Load ⁽⁴⁾				
					6	4	2½	2	
					Nail Spacing at Other Plywood Panel Edges				
					6	6	4	3	
Nail at 12" o.c. to Intermediate Supports									
STRUCTURAL I	6d	1¼	5/16	2 3	190 210	250 280	375 420	420 475	125 140
	8d	1½	3/8	2 3	270 300	360 400	530 600	600 ⁽¹⁾ 675	180 200
	10d	1½	1/2	2 3	320 360	425 480	640 ⁽¹⁾ 720	730 ⁽¹⁾ 820	210 240
C-D C-C Exterior, STRUCTURAL II, and Other Grades Covered in PS-1	6d	1¼	5/16	2 3	170 190	225 250	335 380	380 430	110 125
			3/8	2 3	185 210	250 280	375 420	420 475	125 140
	8d	1½	3/8	2 3	240 270	320 360	480 540	545 ⁽¹⁾ 610	160 180
			1/2	2 3	270 300	360 400	530 600	600 ⁽¹⁾ 675	180 200
	10d	1½	1/2	2 3	290 325	385 430	575 ⁽¹⁾ 650	655 ⁽¹⁾ 735	190 215
			5/8	2 3	320 360	425 480	640 ⁽¹⁾ 720	730 ⁽¹⁾ 820	215 240

TABLE NO. 25-J

DIV. 25

215

NOTES ON TABLE NO. 25-J

NOTES:

- (1) Framing members of the diaphragm boundary shall be not less than 3 inch nominal.
- (2) Table values must be reduced 25 percent if used for normal duration loading.
- (3) Shear Walls—
 - (a) Panel may be vertical or horizontal but all panel edges shall be nailed to studs, plates or blocking. Table No. 25-M and Table No. 48-S are applicable.
 - (b) Stud spacing for 5/16 and 3/8 inch plywood shall be 16 inches for table values. For 3/8 inch plywood on studs at 24 inch centers the table value shall be reduced 15 percent.
 - (c) Plywood (panels or siding) of 5/16 or 3/8 inch thickness may be installed over 1/2 inch gypsum sheathing if the next even larger size nail is used (8d for 6d, or 10d for 8d).
- (d) For 5/16, 3/8 or 1/2 inch plywood (panel or siding) galvanized box nails may be used. Galvanized casing nails may be used in 5/16 or 3/8 inch plywood if the allowable shear values are reduced 20 per cent. This reduction is cumulative with the reduction in (b) above.
- (4) Continuous panel edges parallel to load, where increased nailing may be required, are shown in Cases 3 and 4.
- (5) Allowable shear values shall be reduced where all framing lumber in the assembly is not Group II species as shown in Table 13 of National Design Specification (Douglas Fir-Larch is Group II). For Group III species, use 80% of the tabulated values and for Group IV species, use 65%.

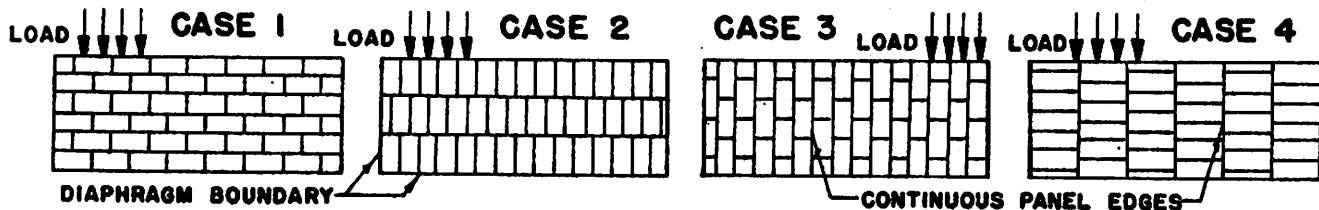


TABLE NO. 25-M PLYWOOD WALL SHEATHING
(Not Exposed to the Weather)

Thickness	Panel Identification Index	MAX. STUD SPACING (Inches)		
		Siding Nailed to Studs	Sheathing Face Grain	
			Parallel to Studs	Perpendicular to Studs
5/16	12/0, 16/0, 20/0	16	—	16
3/8	16/0, 20/0, 24/0	24	16	24
1/2	24/0, 32/16	24	24	24

1x6 let in - across 7 studs max - studs 16" c
2-16d ea stud 3-8d ea stud

$$\frac{2 \times 107 \text{ nail}}{1.33} = 160 \text{ #/ft}$$

$$\frac{3 \times 78}{1.33} = 176 \text{ #/ft.}$$

$$8 \times 3.545 \times 160 = 905 \text{ #/brace}$$

$$996 \text{ #/brace}$$

**TABLE NO. 25-N — ALLOWABLE SHEAR, IN POUNDS PER FOOT, FOR WOOD-STUD WALL ASSEMBLIES.
(SHEAR VALUES ARE BASED ON WIND OR SEISMIC LOADING AND DOUGLAS FIR FRAMING)**

TYPE OF MATERIAL	THICKNESS OF MATERIAL	PANEL EDGES BLOCKED	NAIL SPACING ⁽²⁾ MAXIMUM (INCHES)	SHEAR ⁽¹⁾ VALUE	MINIMUM NAIL SIZE ⁽²⁾
Lumber, Straight Sheathing	1"	—	—	50 ⁽⁷⁾	8d (see Table No. 48-C)
Lumber, Diagonal Sheathing	1"	91.2514(b)1		300 ⁽⁷⁾	8d
	Double 1"	91.2514(b)2		600 ⁽⁷⁾	8d and 12d
Plywood Sheathing ⁽⁵⁾	91.2514(c)			Varies ⁽⁷⁾	(see Table No. 25-J)
Fiberboard	7/16"	Yes	Panel edges—3 Other—6	125 ⁽⁷⁾	No. 11 gauge, 1-1/2" long 7/16" head, galvanized roofing nails.
	25/32"	Yes	Panel edges—3 Other—6	175 ⁽⁷⁾	No. 11 gauge, 1-3/4" long, 7/16" head, galvanized roofing nails.
Cement Plaster on Furred or Self-furring Expanded Metal, or Welded or Woven Wire Fabric Lath	7/8"	No	6	180 ⁽⁷⁾	No. 11 gauge, 1-1/2" long, 7/16" head, barbed. No. 12 gauge, 1-1/4" long, 3/8" head, furring. No. 16 gauge staple, 3/4" crown, 7/8" legs.
Gypsum Lath (Plain or Perforated) and Gypsum Plaster ⁽⁶⁾	3/8" ⁽³⁾	No	5	100	No. 13 gauge, 1-1/8" long 19/64" head, plaster board blued nail.
	1/2"		5 ⁽⁴⁾	50 ⁽⁴⁾	
Gypsum Sheathing Board ⁽⁶⁾	1/2" x 2' x 8" ⁽³⁾	No	4	75	No. 11 gauge, 1-3/4" long, 7/16" head, diamond point gal.
	1/2" x 4'	Yes	4	175	

TABLE NO. 25-N (Continued)

Gypsum, Wallboard ⁽⁶⁾ or Veneer Base ⁽⁶⁾	1/2"	No	7	100	5d cooler nails
		Yes	4	125	
			7	125	
			4	150	
	5/8"	Yes	4	175	6d cooler nails
	2-5/8" one side	Yes	Base Ply-9 Face Ply-7	250 ⁽⁷⁾	Base Ply-6d cooler nails Face Ply-8d cooler nails

NOTES:

- (1) Except for plywood, the total shear resistance of a wall is limited to 600 pounds per foot.
 (2) Nailed to ALL studs, top and sole plates, and edge blocking.
 (3) Installed perpendicular to studs.
 (4) Conventional lathing-nailed to studs ONLY.
 (5) No other material shear value may be additive to plywood.

- (6) The shear values are additive where gypsum materials are applied to both sides of a wall.
 (7) Allowable shear values shall be reduced where all framing lumber in the assembly is not Group II species as shown in Table 13 of National Design Specification (Douglas Fir-Larch is Group II). For Group III species, use 80% of the tabulated values and for Group IV species, use 65%.

DIVISION 26 — CONCRETE

SEC. 91.2601 — GENERAL

91.2601.1 Scope. The design and construction of all concrete used for structural purposes regulated by this Code shall conform to "Building Code Requirements for Reinforced Concrete," ACI-318* with such exceptions, modifications and additions as specifically provided in this Division. ACI-318, dated as specified in Section 91.0404(c), is adopted as a part of this Code except for Chapter 1; Sections 3.2, 3.3, 3.6 of Chapter 3; Sections 4.2, 4.3 of Chapter 4; Appendix A. Provisions set forth elsewhere in this Code which are applicable to this Division shall be fully effective.

Deviations from the ACI Code as allowed by statements contained therein such as: "Authorized by," "approved," or "permitted by the Engineer," shall require approval by the Department of such deviation prior to use.

The Section numbers of this Division (the third and fourth number to the right of the decimal following the 91) designate the corresponding Chapter of ACI-318. Numbers following the Section numbers designate the corresponding section numbers in ACI-318.

91.2601.2 Types of Concrete. All concrete shall conform to one of the types specified in Table No. 01.2.

TABLE NO. 01.2 — TYPES OF CONCRETE

Type	f'_c (psi)	Inspection Required ⁽¹⁾	Permissible Aggregates	Tests of Materials Required	Compression Tests Required
Method II	Maximum 5000 ⁽²⁾ Minimum 2500	Continuous	Special or Specification	Before Using	See Sub- Section 4.3.1
Method I	2500 to 4000	Continuous	Specification	Before Using	See Sub- Section 4.3.1
Standard 2000	2000	Called	Specification	When Ordered	See Sub- Section 4.3.1
Standard Footing	See Sub- Section 4.2.5	Called	Specification	When Ordered	None

NOTES: ⁽¹⁾ As specified in Sections 91.0309 and 91.0310.

⁽²⁾ Higher unit stresses may be used when approved by the Department.

91.2601.3—Strength Requirement. All concrete shall have an average ultimate compressive strength at least equal to the assumed design ultimate compressive strength f'_c , specified on the approved plans.

91.2601.4 Inspection Requirement.

91.2601.4.1 All concrete shall be inspected as specified in Section 91.0309. Continuous inspection at the job site as specified in Section 91.0310 shall be provided on all concrete where the design strength f'_c exceeds 2,000 psi.

91.2601.4.2 When concrete work is performed away from the job site, but not on the premises of an approved fabricator, a Registered Deputy Inspector for reinforced concrete shall perform the following services:

*Obtain copies of ACI-318 from
BUILDING NEWS, INC. See advertisement on inside back cover.

91.2601.4.2.1 Inspection of reinforcement in place prior to placement of any type of concrete;

91.2601.4.2.2 Continuous inspection during batching of concrete where the design strength f'_c exceeds 2,000 psi;

91.2601.4.2.3 Continuous inspection during the placement of any concrete where the design strength f'_c exceeds 2,000 psi.

SEC. 91.2602 — DEFINITIONS

(See ACI-318, Chapter 2)

SEC. 91.2603 — MATERIALS

91.2603.0 Notation (See ACI-318, Section 3.0)

91.2603.1 Tests of Materials (See ACI-318, Section 3.1)

91.2603.2 Cement (In lieu of ACI-318, Section 3.2)

91.2603.2.1 General

91.2603.2.1.1 All cement shall conform to the "Standard Specifications for Portland Cement," ASTM C150 or "Specifications for Air-Entraining Portland Cement" ASTM C175. Cement shall not be used in concrete, except Standard Footing type concrete, until it has been tested and found to conform.

91.2603.2.1.2 Cement that shows evidence of damage or deterioration after sampling shall be re-sampled and re-tested before use.

91.2603.2.1.3 Any of the Types of cement included in the above specifications may be used except that Type IV cement may be used only in concrete proportioned by Method II. (Section 91.2604.2.2.2)

91.2603.2.2. Test Verification

91.2603.2.2.1 No cement required to be tested shall be used until there is on file in the Office of the Superintendent of Building a certificate giving the following information with regard to the cement to be used:

Manufacturer's name and brand;

Place of sampling;

ASTM type designation;

Silo number, if sampled at mill;

Lot number;

Agency performing test;

Number of barrels in lot;

Statement that the cement referred to has passed the required tests and conforms to ASTM C150;

Signature of person making the certificate of test, and date of execution of certificate.

91.2603.2.2.2 All tests on cement shall be performed by an approved testing agency. Cement mill laboratories may be approved as testing agencies for this purpose when evidence has been submitted to show that they are qualified to perform tests.

91.2603.2.3 Certificate of Identification. All shipments of cement to a jobsite, or fabrication plant, either in bulk, sacks or in ready-mixed concrete shall be accompanied by load tickets bearing the following information:

1. Brand name of the cement;

2. Quantity of cement in the shipment;

3. Name of testing agency, if other than the cement mill laboratory;

4. Lot or test number as certified in Subsection 3.2.2.

91.2603.3 Aggregates (In lieu of ACI-318, Section 3.3)

91.2603.3.1 General. All aggregates used in structural concrete shall be stone aggregates or approved lightweight aggregates.

91.2603.3.2 Stone Aggregate. Stone aggregate shall meet the requirements of "Standard Specifications for Concrete Aggregates," ASTM Designation C33. Aggregate failing to meet these specifications, but which has been shown by special tests or actual service to produce concrete of adequate strength and durability, may be used when approved by the Department.

91.2603.3.3 Lightweight Aggregate. Only approved lightweight aggregate shall be used in concrete carrying calculated stresses.

91.2603.3.4 Size Limitation. Except as permitted elsewhere in this Code, the maximum size of aggregate shall be not more than one-fifth of the narrowest dimension between sides of the forms of the member for which the concrete is to be used nor larger than three-fourths of the minimum clear spacing between individual reinforcing bars or bundles of bars. The aggregate size in concrete used in columns shall not exceed two-thirds of the minimum clear spacing between individual reinforcing bars or bundles of bars.

91.2603.3.5 Testing of Aggregates.

91.2603.3.5.1 All aggregates to be used in concrete where the design strength f'_c exceeds 2,000 psi, shall be tested before using, by an approved testing agency, and further tests shall be performed whenever there is evidence of a change in the character of the material.

91.2603.3.5.2 All aggregates for use in concrete shall be tested when, in the opinion of the Department, the aggregate does not conform to the provisions of this Section.

91.2603.4 Water (See ACI-318, Section 3.4)

91.2603.5 Metal Reinforcement (See ACI-318, Sections 3.5.1 through 3.5.12 and the following:)

91.2603.5.13 Tests

91.2603.5.13.1 Except as specified in this Section all required reinforcement shall be tested in conformity with the ASTM specification listed in Subsection 3.5.1 through 3.5.12 of this Section.

EXCEPTION: Unless there is evidence of nonconformity with the "Standard Specifications" listed in Subsections 3.5.1 through 3.5.12 of this Section, the following reinforcement need not be tested:

Reinforcement for use in standard footing concrete;

Any reinforcement when the yield stress used in design is not in excess of 50 percent of the specified yield stress f_y ;

Any reinforcement other than prestressed concrete reinforcement where the total amount used in the structure does not exceed five tons, if the Department finds that no hazard exists.

91.2603.5.13.2 When high-strength prestressing strands, wires or rods are used, samples shall be taken from one end of

selected coils of strand or wire, or from selected rods as delivered on the job and shall be tested by an approved testing agency prior to the placing of concrete. A minimum of one sample per each 5000 pounds or fraction thereof from each heat used on the job shall be tested.

91.2603.5.13.3 No required reinforcement shall be encased in concrete until there is on file in the office of the Superintendent of Building a certificate from an approved testing agency giving the following information with regard to the reinforcement to be used:

- Place of sampling;
- ASTM designation number;
- Size of reinforcement;
- Number of tons represented by the test;
- Testing agency's lot number and laboratory number;
- Name of manufacturer and brand of deformation, when known;
- Manufacturer's heat identification, when known;
- Manufacturer's chemical analysis, when known;
- Statement that the reinforcement referred to has passed the required tests;
- Signature of person making the certificate and date of execution of the certificate.

91.2603.5.13.4 The testing agency's lot number may include all sizes of bars of the same heat number but shall not include more than one heat number.

91.2603.5.13.5 At least one tensile and one bending test shall be made of each 25 tons or fraction thereof of each size of reinforcement in each lot.

91.2603.5.13.6 When the name of the manufacturer, or the heat identification number, or the manufacturer's chemical analysis is not known, the testing agency's lot number may include any amount of reinforcement, but at least one tensile and one bending test shall be made of each five tons, or fraction thereof, of each size of reinforcement in each lot.

91.2603.5.14 Certificate of Identification. When any reinforcement is required to be tested before use, it may be sampled at the site, or every delivery to the site shall be accompanied by a Certificate of Identification. The Certificate of Identification shall be issued by the dealer or fabricator furnishing the reinforcement, shall be delivered to the Superintendent of Building at the site and shall bear the following data relating to the reinforcement in the shipment:

- Dealer's name and address;
- Address of site;
- Number of tons of each size in the shipment;
- Name of testing agency;
- Testing agency's lot number;
- Signature of person making the certificate and date of execution of the certificate.

91.2603.6 Admixtures (In lieu of ACI-318, Section 3.6)

91.2603.6.1 General

91.2603.6.1.1 An approved admixture may be used in concrete, but only in an approved proportion. Compatible admixtures may be used in combination in a mix when approved for use in such combination, but only in approved proportions.

91.2603.6.1.2 Admixtures containing calcium chloride shall not be used in prestressed concrete.

91.2603.6.1.3 Any admixture which is added to concrete at the job site shall be delivered to the site in a sealed container bearing the name of the manufacturer, the brand name and type designation.

91.2603.6.2 Approval. To secure General Approval of an admixture to be used in concrete, the admixture shall be shown to conform to the following regulations:

91.2603.6.2.1 A certified statement of the chemical composition shall be filed in the office of the Superintendent of Building;

91.2603.6.2.2 No admixture shall contain deleterious amounts of any substance;

91.2603.6.2.3 Admixtures shall be tested by an approved testing agency and, with the exception of those used only for air-entrainment, admixtures shall show conformance with either ASTM Specification C494 entitled, "Chemical Admixtures for Concrete," or with alternate specifications approved by the Superintendent of Building. Admixtures used only for air-entrainment shall comply with ASTM Specification C260 entitled, "Air-Entraining Admixtures for Concrete," with the exception that the control reference mix shall be mixed without the inclusion of a reference air-entrainment admixture.

91.2603.7 Storage of Materials (See ACI-318, Section 3.7)

91.2603.8 Specifications Cited in this Code (See ACI-318, Section 3.8)

SEC. 91.2604 — CONCRETE QUALITY

91.2604.0 Notation (See ACI-318, Section 4.0)

91.2604.1 General (See ACI-318, Section 4.1)

91.2604.2 Proportioning of Concrete Mixtures (In lieu of ACI-318, Section 4.2)

91.2604.2.1 General Requirements. Concrete made using only portland cement, aggregates conforming to Section 91.2603.3, water, and approved admixtures shall be proportioned to conform to the requirements of Subsection 4.2.2 of this Section. Concrete using materials other than those which are specifically permitted by this Code shall be tested prior to use and may be used only as approved by the Department.

91.2604.2.2 Proportioning of Designed Concrete Mixes. The determination of proportions of cement, aggregate and water shall be made by one of the following methods. The cement content so determined shall be not less than five sacks of cement per cubic yard. The maximum slump for concrete shall be six inches. Alternate methods of proportioning and slump requirements may be used when specifically approved by the Department.

91.2604.2.2.1 Method I — Without Preliminary Test. Where preliminary test data on the mix proportions of materials to be used in the concrete have not been obtained, the water-cement ratio shall not exceed the values shown in Table No. 4.2.1. Combined aggregate gradation shall conform to limits specified in Table No. 4.2.2. Selection of proportions are to be made in conformance with ACI-211.1-70, "Recommended Practice for Selecting Proportions for Concrete." When strengths in excess of

4000 psi are required or when lightweight aggregates or admixtures (other than those exclusively for the purpose of entraining air) are used, the mix proportions shall be determined in accordance with Method II.

91.2604.2.2.2 Method II — For Combinations of Materials Previously Evaluated or to be Established by Trial Mixtures. Water-cement ratios or strengths greater than shown in Table No. 4.2.1 may be used, provided that the relationship between strength and water-cement ratio for the materials to be used has been previously established by reliable test data and the resulting concrete satisfies the requirements of this Section.

Where previous data are not available, concrete trial mixtures having proportions and consistency suitable for the work shall be made, using at least three different water-cement ratios (or cement content in the case of lightweight aggregates) which will produce a range of strengths encompassing those required for the work. These tests shall be made in accordance with the procedure given in the appendix to "Recommended Practice for Selecting Proportions for Concrete" (ACI-211.1-70) or "Recommended Practice for Selecting Proportions for Structural Lightweight Concrete" (ACI-211.2-69). For each water-cement ratio (or cement content), at least three specimens for each age to be tested shall be made and cured in accordance with "Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Laboratory" (ASTM C192) and tested for strength in accordance with "Method of Test for Compressive Strength of Molded Concrete Cylinders" (ASTM C39).

The strength tests shall be made at 28 days or the earlier age at which the concrete is to receive load, as indicated on the plans. A curve shall be established showing the relationship between water-cement ratio (or cement content) and compressive strength. The maximum permissible water-cement ratio for the concrete to be used in the structure shall be that shown by the curve to produce an average strength to satisfy the requirements of this Section.

Where different materials or proportions are to be used for different portions of the work, each combination shall be evaluated separately.

The average trial batch strength for the proposed mix design shall exceed the specified strength, f'_c , by 25% or 750 psi, whichever is less.

91.2604.2.3 Statement of Mix Design by Method II for Concrete. The proportions of cement, aggregate, and water, and admixture (when used) necessary to attain the specified strength of the concrete at the job site shall be set forth in a "Statement of Mix Design for Concrete" by a Civil Engineer or Architect registered in California. The statement shall include the following:

- Job Address;
 - Specified strength f'_c ;
 - Complete description of type and quantity of each ingredient used in the mix, listed for a one-yard mix;
 - Maximum aggregate size;
 - Primary aggregate gradation;
 - Average strength (based on laboratory prepared cylinders);
 - Cement content (sacks per yard);
 - Water/cement ratio (gallons per sack);
 - Maximum slump;
 - Signature of the Registered Civil Engineer or Architect responsible for the mix design.
- Copies of the "Statement of Mix Design for Concrete" shall

TABLE NO. 04.2.1. — MAXIMUM PERMISSIBLE WATER-CEMENT RATIOS FOR CONCRETE MIXES DESIGNED BY METHOD NO. I

Specified compressive strength at 28 days, psi f'_c	Maximum permissible water-cement ratio ⁽¹⁾			
	Non-air-entrained concrete		Air-entrained concrete	
	U.S. gal. per 94-lb. bag of cement	Absolute ratio by weight	U.S. gal. per 94-lb. bag of cement	Absolute ratio by weight
2500	7½	0.642	6¼	0.554
3000	6½	0.576	5¼	0.465
3500	5¾	0.510	4½	0.399
4000	5	0.443	4	0.354

NOTE: ⁽¹⁾ Including free surface moisture on aggregates.

TABLE NO. 04.2.2 — GRADATION REQUIREMENTS FOR COMBINED AGGREGATES

Percentage By Weight Of Aggregates Passing Sieve			
Sieve Size	¾" Size Aggregate	1" Size Aggregate	1½" Size Aggregate
2 inch			100
1½ inch		100	90 to 100
1 inch		80 to 100	60 to 85
¾ inch	100	70 to 90	50 to 75
½ inch	92 to 100	45 to 65	39 to 55
No. 4	42 to 60	35 to 52	32 to 44
No. 8	33 to 47	22 to 42	23 to 35
No. 16	27 to 37	17 to 33	17 to 27
No. 30	17 to 25	11 to 25	10 to 19
No. 50	6 to 11	4 to 17	3 to 10
No. 100	1 to 5	1 to 8	1 to 6
No. 200	0 to 3	0 to 3	0 to 3

TABLE NO. 04.2.4 — STANDARD 2000 PSI CONCRETE PROPORTIONS

f'_c	Maximum Aggregate Size	Maximum Water Gallons Per Sack	Minimum Cement Sacks Per Cu. Yd.
2000	¾"	8.0	5.7
2000	1"	8.0	5.2
2000	1½"	8.0	5.0

be in the office of the Building Inspection Division at the Department of Building and Safety and the batch plant prior to batching of the concrete and at the job site prior to placing the concrete.

91.2604.2.4 Proportioning of Standard 2000 psi Concrete. The proportions of cement, aggregates and water shall conform to Table No. 4.2.4. Combined aggregate gradation shall conform to the limit specified in Table No. 4.2.2.

91.2604.2.5 Proportions for Standard Footing Concrete. Where permitted by Division 48, concrete may be batched volumetrically as follows:

One (1) part cement

Three (3) parts sand;

Four (4) parts 1" maximum aggregate;

8½ gallons of water maximum per sack of cement.

No allowable design stress may be assumed. Where tests are required by Section 91.2604.3, the 28-day field strength of concrete shall be at least equal to 1500 psi.

91.2604.3 Evaluation and Acceptance of Concrete (In lieu of ACI-318, Section 4.3)

91.2604.3.1 Testing Required During Placement. Concrete slump and compression tests shall be made in accordance with the methods specified in 91.2604.3.2 on samples taken at the discharge from the mixer in the following amounts:

91.2604.3.1.1 Each test shall consist of a slump test and two or more compressive strength specimens tested at the specified age, and the strength indicated by the test shall be the average of the strengths of the two or more specimens tested.

91.2604.3.1.2 There shall be not less than one test for each 50 cubic yards of structural concrete for each grade of concrete used, and there shall be at least one test for each day's concreting for each grade of concrete used.

EXCEPTIONS: 1. For any single day's concreting in which the total volume of concrete of any one grade exceeds 150 cubic yards, that concrete in excess of 150 cubic yards may be represented by one test for each 150 cubic yards or fraction thereof.

2. Tests are not required for Standard Footing concrete.

3. Tests are not required for Standard 2000 psi concrete when the total amount of Standard 2000 psi concrete in the structure is less than 50 cubic yards.

4. Additional tests may be required by the Superintendent of Building whenever there is evidence that any concrete being placed does not conform to the provisions of this Code.

91.2604.3.2 Test Cylinders. Whenever compression tests are required of specimens made at the site, the specimens shall be made and cured in accordance with the "Standard Method of Making and Curing Compression Test Specimens of Concrete in the Field," ASTM Designation C31, and the compressive strength shall be determined in accordance with the "Standard Method of Making Compression Tests of Concrete," ASTM C39.

91.2604.3.3 Specified Age. The specimen age for compressive strength tests shall be 28 days.

EXCEPTION: When noted on the approved plans as a condition of the design, the specimen age for compressive strength tests shall be the earlier age at which the concrete is required to attain the specified strength.

91.2604.3.4 Strength Requirements at Site.

91.2604.3.4.1 The average of all strengths exhibited by tests on cylinders made in the field, moist-cured in the laboratory, and representing one grade of concrete shall be equal to or greater than the specified strength, and not more than one out of any ten consecutive strength tests may have values less than the specified strength, and no specimen shall exhibit a strength less than 90 per cent of the specified strength.

91.2604.3.4.2 For post-tensioned concrete, cylinder test results of the concrete shall be provided at the time of initial prestress to verify the value of f'_{ci} .

91.2604.3.5 Tests of Hardened Concrete. Whenever in the opinion of the Superintendent of Building the hardened concrete does not conform to the requirements of this Code, the Superintendent may require that core or load tests be performed. The

owner may, instead, choose to replace all concrete that is suspected of nonconformity.

91.2604.3.5.1 Core Test. Cores shall be taken following "Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete," ASTM C42.

The cores shall be taken at places designated by the Superintendent of Building and shall be at least six inches in diameter unless smaller diameters are necessary to avoid critical reinforcing steel and due allowances are made for the smaller diameters. Corrections shall be made for the ratio of length to diameter of core. The core tests shall be evaluated by the engineer or architect responsible for the structural design of the building to determine whether they indicate a strength to satisfy the design strength requirements. Acceptance of concrete on the basis of core tests shall be subject to the approval of the Superintendent of Building.

91.2604.3.5.2 Load Tests. When the load-test method is used, the member or portions of the structure under consideration shall be subject to the conditions and requirements of Chapter 20 of the ACI-318 and the limitations of Section 91.2620.1.

91.2604.3.6 Test Failure. If the member or portion of the structure under consideration fails to pass the load test or core test, the permittee shall make such changes or modifications as are necessary to provide the strength required by the approved plans.

91.2604.3.7 Responsibility. All testing and replacement shall be done without expense to the City.

SEC. 91.2605 — MIXING AND PLACING CONCRETE

91.2605.1 Preparation of Equipment and Place of Deposit (See ACI-318, Section 5.1)

91.2605.2 Mixing of Concrete (See ACI-318, Section 5.2)

91.2605.3 Conveying (See ACI-318, Section 5.3)

91.2605.4 Depositing (See ACI-318, Section 5.4)

91.2605.5 Curing (See ACI-318, Sections 5.5.1, 5.5.2, and the following):

91.2605.5.3 Standard footing concrete as described in Section 91.2604.2.5 need not be kept moist during curing.

91.2605.6 Cold Weather Requirements (See ACI-318, Section 5.6)

91.2605.7 Hot Weather Requirements (See ACI-318, Section 5.7)

SEC. 91.2606 — FORMWORK, EMBEDDED PIPES, AND CONSTRUCTION JOINTS (See ACI-318, Chapter 6)

SEC. 91.2607 — DETAILS OF REINFORCEMENT

91.2607.0 Notation (See ACI-318, Section 7.0)

91.2607.1 Hooks and Bends (See ACI-318, Section 7.1)

91.2607.2 Surface Condition of Reinforcement (See ACI-318, Section 7.2)

91.2607.3 Placing Reinforcement (See ACI-318, Section 7.3)

91.2607.4 Spacing of Reinforcement (See ACI-318, Section 7.4)**91.2607.5 Splices in Reinforcement — General**

91.2607.5.1 (In lieu of ACI-318, Section 7.5.1) Splices in reinforcement shall be made only as shown or specified on the approved plans, or as authorized by the design engineer or architect and the Superintendent of Building. The design, details and workmanship of welded splices in reinforcement shall be set forth in "Reinforcing Steel Welding Code" (A.W.S. D12.1) as published by the American Welding Society. Welding procedures shall be as approved in accordance with rules and regulations established by the Superintendent of Building. All welding shall be done by welders certified specifically for the welding of reinforcing steel in accordance with the provisions of Section 91.0312.1. A.S.T.M. A615, A616 and A617 shall not be welded except as approved by the Superintendent of Building. Each application for approval of a \rightarrow qualified \leftarrow welding procedure shall be accompanied by a fee of \$50 for each separate welding procedure.

91.2607.5.2 through 91.2607.5.5 (See ACI-318, Sections 7.5.2 through 7.5.5)

91.2607.6 Splices in Tension (See ACI-318, Section 7.6)**91.2607.7 Splices in Compression (See ACI-318, Section 7.7)****91.2607.8 Splices of Welded Plain Wire Fabric (See ACI-318, Section 7.8)****91.2607.9 Splices of Deformed Wire and Welded Deformed Wire Fabric (See ACI-318, Section 7.9)****91.2607.10 Special Details for Columns (See ACI-318, Section 7.10)****91.2607.11 Connections (See ACI-318, Section 7.11)****91.2607.12 Lateral Reinforcement (See ACI-318, Sections 7.12.1 and 7.12.2)**

91.2607.12.3 (See ACI-318, Section 7.12.3 and the following): The spacing of ties for tied columns in that portion of the column over a length equal to the maximum column dimension or one-sixth of the clear height of the column, but not less than 18 inches from either face of the joint, shall not exceed 50 percent of the spacing as set forth in this Section. The spacing of ties in other portions of the column shall be as set forth in this Section but shall not exceed 18 inches. The ties shall terminate in a hook with a minimum bend of 135° and with a minimum extension of 6 bar diameters or 4 inches, whichever is the greater.

Additional ties which engage at least four longitudinal column bars shall be provided around anchor bolts which are set in the top of a column. Such ties shall be within five inches of the top of the column and shall consist of not less than two #4 or three #3 bars.

91.2607.12.4 through 91.2607.12.7 (See ACI-318, Sections 7.12.4 through 7.12.7)**91.2607.13 Shrinkage and Temperature Reinforcement (See ACI-318, Section 7.13)****91.2607.14 Concrete Protection for Reinforcement (See ACI-318, Section 7.14)**

TABLE NO. 8.11 — ALLOWABLE SHEAR AND TENSION ON BOLTS, CAST IN PLACE (In Pounds)⁽¹⁾⁽²⁾

DIAMETER (In Inches)	MINIMUM EMBEDMENT (In Inches)	SHEAR		TENSION
		MINIMUM 2000	CONCRETE 3000	STRENGTH (in psi) 2000 to 5000
¼	2½	250	250	200
⅜	3	550	550	500
½	4	1000	1000	950
⅝	4	1375	1500	1500
¾	5	1470	1780	2250
⅞	6	1790	2075	3200
1	7	1790	2075	3200
1¼	8	1790	2250	3200
1½	9	1790	2650	3200

NOTES: ⁽¹⁾ Values shown are allowable service loads for work without continuous inspection by a deputy inspector. When continuous inspection by a deputy inspector is provided, the values may be increased 100 percent.

Values are for natural stone aggregate concrete and bolts of at least A307 quality. Bolts shall have a standard bolt head or an equal deformity in the embedded portion.

Values are based upon a bolt spacing of 12 diameters with a minimum edge distance of 6 diameters. Such spacing and edge distance may be reduced 50 percent with an equal reduction in value. Use linear interpolation for intermediate spacings and edge margins.

⁽²⁾ An additional 2 inches of embedment shall be provided for anchor bolts located in the top of columns.

SEC. 91.2608 — ANALYSIS AND DESIGN — GENERAL CONSIDERATIONS (See ACI-318, Chapter 8 and the following:)

91.2608.11 Anchor Bolts. The shear and tension on anchor bolts embedded in concrete shall be limited as set forth in Table No. 8.11.

SEC. 91.2609 — STRENGTH AND SERVICEABILITY REQUIREMENTS (See ACI-318, Chapter 9)

SEC. 91.2610 — FLEXURE AND AXIAL LOADS (See ACI-318, Chapter 10)

SEC. 91.2611 — SHEAR AND TORSION (See ACI-318, Chapter 11)

SEC. 91.2612 — DEVELOPMENT OF REINFORCEMENT (See ACI-318, Chapter 12)

SEC. 91.2613 — SLAB SYSTEMS WITH MULTIPLE SQUARE OR RECTANGULAR PANELS (See ACI-318 Chapter 13)

SEC. 91.2614 — WALLS (See ACI-318, Chapter 14)

SEC. 91.2615 — FOOTINGS (See ACI-318, Chapter 15)

SEC. 91.2616 — PRECAST CONCRETE (See ACI-318, Chapter 16 and the following:)

91.2616.2.3 Vertical and horizontal joints in precast concrete walls shall be designed to resist all design forces. Ties of not less than 50 percent of the horizontal wall steel requirements for reinforced concrete shall be provided across the vertical joint. Spacing of ties shall not exceed 12 times the panel thick-

ness. Horizontal joints between precast elements shall be similar to the vertical joint.

EXCEPTIONS: 1. For buildings that do not require the exterior walls to have more than a two-hour, fire-resistive time period rating, the panels may be joined at the vertical joints by welding plate inserts to the structural steel frame placed next to the inside face of the wall. The joint between panels shall be sealed with grout or with other material specifically approved by the Department.

2. Properly designed expansion joints may be used in the walls.

SEC. 91.2617 — COMPOSITE CONCRETE FLEXURAL MEMBERS (See ACI-318, Chapter 17)

SEC. 91.2618 — PRESTRESSED CONCRETE (See ACI-318, Chapter 18 and additions or modifications thereto as set forth herein)

91.2618.1.2 (See ACI-318, Section 18.1.2 and the following:) All concrete shall conform to the regulations for concrete designed by Method II of Section 91.2604.2.2.2.

91.2618.2.3 (See ACI-318, Section 18.2.3 and the following:) When post-tensioned prestressed elements are poured monolithically with, or rigidly connected to other portions of a structure, the effects of creep, elastic shortening, and drying shrinkage shall be accounted for in the design. The determination of effective prestress in the concrete shall take into account any force necessary to deflect columns or walls to allow for shortening of the prestressed element.

91.2618.2.5 (The following is in addition to ACI-318, Section 18.2) Continuity across closure strips shall not be assumed in the design unless proper provisions are made to account for shortening, creep, shrinkage and movements at the joint.

91.2618.9 Minimum Bonded Reinforcement Requirements. (In lieu of ACI-318, Section 18.9)

91.2618.9.1 Unbonded, post-tensioned members other than flat plates shall be designed to carry the dead load of the member plus 25 percent of the unreduced superimposed live load by some method other than the primary unbonded post-tensioned reinforcement. Strength method design may be used with a load factor and capacity reduction factor equal to one. All reinforcement other than primary unbonded reinforcement provided to meet other requirements of this section may be used in this design.

91.2618.9.2 The minimum amount and distribution of bonded reinforcement. A_s in two-way flat plates utilizing unbonded prestressing steel shall conform to the provisions of this section.

91.2618.9.2.1 Bonded reinforcement shall not be required in positive moment areas where the concrete tensile stress at service load after all losses is equal to or less than $2\sqrt{f'_c}$.

91.2618.9.2.2 In positive moment areas, where the concrete tensile stress at service load is greater than $2\sqrt{f'_c}$, bonded reinforcement A_s in each direction shall be:

$$A_s = \frac{N_c}{0.5 f_y} \quad (18-6)$$

Where N_c = tensile force in the concrete under service load and f_y shall not exceed 60,000 psi. The bonded reinforcement shall be uniformly distributed over the tension zone near the extreme tension fiber.

91.2618.9.2.3 In negative moment areas bonded reinforcement shall be provided in each direction in an amount equivalent to 0.15 percent of the gross cross sectional area of the column strip. The bonded reinforcement shall be located within a distance 1.5h out from opposite faces of the column, it shall not be spaced greater than 12 inches on centers, and not less than four bars or wires shall be used in each direction. The lengths of the bonded reinforcement shall be in accordance with Section 13.5.6 of ACI-318.

91.2618.13—Slab Systems. (See (ACI-318, Section 18.13 and the following:)) Distribution of moments in a slab at a ratio of not less than 60 percent to the column strip and not more than 40 percent to the middle strip will be permitted in lieu of the distribution specified for conventionally reinforced slabs. Distribution other than as permitted herein may be permitted when substantiating data, satisfactory to the Department, is submitted.

The maximum spacing of tendons in column strips shall be 32" for slabs, 9" or less in thickness, and 36" for slabs greater than 9". Maximum spacing in the middle strips shall not exceed 42".

In lift-slab construction deformed mild steel reinforcement shall be placed within the lower one-half of the slab and shall be passed through the collar, or welded, or connected in an approved manner to develop the full strength of the reinforcement. Reinforcement length shall be equivalent to 1/4 of the span length of the slab in the direction under consideration. The area of the reinforcement shall be:

$$A_s \text{ (in}^2\text{)} = \frac{\text{Total Trib. Vertical Load (kips)}}{25}$$

and shall be distributed around the support in proportion to the slab loading.

91.2618.18 Steel Tendons. (See ACI-318, Section 18.18 and the following.) Twisting or entwining of individual steel wires or strands within a bundle or beam shall not be permitted.

The drape of the tendons shall be fully defined on the plans giving co-ordinates to all critical points.

Tendons shall be secured to a sufficient number of positioning devices to assure the correct location during and after the placing of concrete.

No splices or coupling of the tendons shall be permitted unless coupling devices are specifically approved for such use.

Tendons shall be curved or deflected in a single plane only, unless there is a 48" length of straight cable between the beginning of the bend in one plane and the beginning of a bend in another plane. In post-tensioning, the minimum radius of curvature shall be not less than 10 times the depth of the section and the total angle change along the steel profile from any point on a tendon to the nearest jacking point shall not exceed 45 degrees.

SEC. 91.2619—SHELLS AND FOLDED PLATE MEMBERS (See ACI-318, Chapter 19)

SEC. 91.2620—STRENGTH EVALUATION OF EXISTING STRUCTURES (See ACI-318, Chapter 20 except as follows:)

91.2620.1 Strength Evaluation—General. If doubt develops concerning the safety of a structure or member, the Department

may order a structural strength investigation by analysis or by means of load tests or by a combination of these methods. Such analysis or load test shall not be construed to waive, obviate, or to mitigate any of the other provisions of this Code and shall require the approval of the Superintendent of Building.

SEC. 91.2621 — PNEUMATICALLY PLACED CONCRETE

91.2621.1 General. For the purpose of this division all pneumatically placed concrete shall consist of a mixture of fine aggregate (3% to 6% moisture content) and cement pneumatically placed by a suitable mechanism, and to which water is added immediately prior to discharge from the nozzle.

91.2621.2 Materials

91.2621.2.1 The proportions of cement to aggregate in loose dry volumes shall not be less than 1 to 4½. The quantities of aggregate and cement shall be accurately measured.

91.2621.2.2 Cement. All cement shall comply with Section 91.2603.2 of this Code.

91.2621.2.3 Aggregate.

91.2621.2.3.1 All aggregates shall comply with the requirements of this Division for fine aggregate. Where approved by the Superintendent of Building, lightweight aggregates may be used in pneumatically placed concrete.

91.2621.2.3 Rebound may be reused if it conforms to the requirements for aggregate, but not in excess of 25% of the total aggregate in any batch.

91.2621.2.4 Water. The proportions of water to cement shall be accurately controlled so as to produce thorough and uniform hydration of the concrete which, when placed, will form a homogeneous mass containing neither sags nor dry sand formation. An accurately calibrated pressure gage shall be provided in the water line. The water shall have a minimum pressure of 60 psi plus an additional 5 psi for each 10' of rise in elevation between the pressure gage and the nozzle.

91.2621.3 Equipment. The cement and aggregate shall be mixed without added water in a batch mixer for not less than one minute and shall be discharged completely before the mixer is recharged. Other types of mixing equipment may be used when approved by the Department. Nozzles used to place concrete for structural purposes shall have a maximum size of 1½".

91.2621.4 Limitation on Use.

91.2621.4.1 General. Pneumatic concrete shall not be placed where the stream from the nozzle cannot directly impinge on the surface on which the concrete is to be placed. Where shooting conditions are difficult, the proper results shall be obtained by maintaining normal air pressure and water ratio and reducing the supply of material.

91.2621.4.2 Columns. Pneumatic concrete shall not be applied to spiral columns. Pneumatic concrete may only be applied to tied columns where the spacing of the reinforcing steel is sufficient to allow the proper application of the concrete.

91.2621.4.3 Walls. Where pneumatic concrete is to be applied to walls, the minimum spacing of the reinforcing steel shall be six bar diameters for walls with one curtain of steel. Where two curtains of steel are provided, the curtain nearest

the nozzle shall have a minimum spacing of 12 bar diameters and the remaining curtain shall have a minimum spacing of six bar diameters. Reinforcing steel shall have a minimum spacing of three bar diameters at splices. In all cases the minimum clear distance between reinforcing bars, other than mesh, shall be $2\frac{1}{2}$ inches.

EXCEPTION: Contact splices may be made in bars not larger than #5.

91.2621.5 Placing.

91.2621.5.1 Whenever possible, except when enclosing reinforcing steel, the nozzle shall be held at right angles to the surfaces and a distance of not more than three feet.

91.2621.5.2 Any deposits of loose sand or rebound shall be carefully removed from the surface before applying additional concrete. When enclosing reinforcing steel, the nozzle shall be held so as to direct the material around the bars. Each bar shall be shot from at least two directions. A second experienced man equipped with an air jet shall attend the operators whenever reinforcing steel is being enclosed and shall carefully precede the nozzle and blow out all rebound and sand which may be lodged behind the steel.

EXCEPTION: Where pneumatic concrete is to be deposited against earth, other approved means may be used to remove rebound.

91.2621.5.3 Placing of pneumatic concrete shall be started at the bottom of the section and the top surface shall be held at a minimum of 45 degrees with the horizontal to facilitate removal of rebound. Pneumatic concrete shall be applied to beams from the side to permit removal of the rebound.

91.2621.5.4 If pneumatic concrete is to be applied below the ground surface, an excavation of at least 4'-0" wider than the completed construction shall be provided to permit proper positioning of the nozzle, unless other procedures acceptable to the Department are detailed on the approved plans. Unfinished work shall not be allowed to stand for more than 30 minutes unless all abrupt edges are sloped to a thin edge. Before resuming work, this sloped portion shall be cleaned and, where the concrete has reached its initial set, the surface shall be thoroughly wetted.

91.2621.5.5 All chases and recesses shall have a width fifty percent greater than their depth.

91.2621.5.6 The air pressure at the machine end of the hose shall be not less than 45 psi for hose lengths of 100 feet or less and shall be increased 5 psi for each additional 50 feet, or fraction thereof, for hose in excess of the first 100 feet. In addition, the air pressure shall be increased 5 psi for each 25 feet, or fraction thereof, of vertical rise.

91.2621.6 Curing. Pneumatic concrete shall be kept constantly damp for a period of not less than 14 days after being deposited, unless other approved methods are specified on the stamped plans.

91.2621.7 Defective Work. Rebound, pockets, sags, sloughing or other defects occurring in the work shall be cut out and replaced.

91.2621.8 Testing.

91.2621.8.1 A minimum of three cores shall be taken for each 150 cubic yards, or fraction thereof, of pneumatic concrete

deposited. The cores shall be taken and tested by the methods described in "Obtaining and Testing Cores and Beams of Concrete" ASTM C42. The cores shall be tested 28 days from the date the pneumatic concrete is deposited and the tests shall show a 28-day strength at least equal to the f'_c specified on the plans.

EXCEPTION: Where the quantity of pneumatic concrete deposited is less than 3 cubic yards, one core test shall be provided for each cubic yard or fraction thereof.

A suitable test may be substituted for cores where the design is based on a maximum of 2,000 psi and less than 50 cubic yards of pneumatic concrete is deposited.

91.2621.8.2 Where the condition precludes the possibility of obtaining cores from the structure, the Superintendent of Building may approve cores taken from a representative test panel made at the same time and under the same conditions as the concrete is deposited.

91.2621.9 Inspection. The application of all pneumatic concrete shall be continuously inspected by a Registered Deputy Inspector approved by the Department.

91.2621.10 Design. The design of all pneumatically placed concrete shall be based on stresses not exceeding 3000 psi except where higher design stresses are approved by the Superintendent of Building. The fundamental principles used in the design of reinforced pneumatic concrete shall be the same as those for reinforced concrete as given in this Division.

EXCEPTION: Where bars larger than #7 are used, the development length as determined in accordance with ACI-318, Chapter 12 shall be increased one-third.

SEC. 91.2622 — CONCRETE DUCTILE MOMENT-RESISTING SPACE FRAMES

91.2622.1 General.

91.2622.1.1 Design and construction of cast-in-place, monolithic reinforced concrete framing members and their connections in ductile moment resisting space frames shall conform to the requirements of ACI Building Code, ACI-318, and all the requirements of this Section.

EXCEPTION: Precast concrete frame members may be used, if the resulting construction complies with all provisions of this Section.

91.2622.1.2 All lateral load-resisting frame members shall be designated by the strength design method except that the alternate design method may be used, provided that it is shown that the factor of safety is equivalent to that achieved with the strength design method.

91.2622.1.3 Equations (9-2) and (9-3) of ACI-318, for earthquake loading, shall be modified to:

$$U = 1.40 (D + L + E)$$

$$U = .90 D + 1.40 E$$

91.2622.1.4 Members of space frames which are designed to resist seismic forces shall be designed, in accordance with the provisions of this Section, so that shear failures will not occur if the frame is subjected to lateral displacements in excess of yield displacements.

91.2622.2 Definitions.

91.2622.2.1 Confined Concrete. Concrete which is confined by closely spaced special transverse reinforcement which is provided to restrain the concrete in directions perpendicular to the supplied stresses.

91.2622.2.2 Special Transverse Reinforcement. Spirals, stirrup-ties or hoops and supplementary cross ties provided to restrain the concrete to make it qualify as confined concrete.

91.2622.2.3 Stirrup-ties or Hoops. Continuous reinforcing steel of not less than a No. 3 bar bent to form a closed hoop which encloses the longitudinal reinforcing and the ends of which have a standard 135 degree bend with a 10 bar diameter extension or equivalent.

91.2622.3 Symbols and Notations. The following symbols and notations apply only to the provisions of this Section:

A_{ch}	= area of rectangular core of column measured out-to-out of hoop, square inches
A_g	= gross area of column, square inches
A_s	= effective cross-sectional area of nonprestressed reinforcement, square inches
A'_s	= effective cross-sectional area of nonprestressed compression reinforcement, square inches
A_{sh}	= total cross-sectional area of hoop reinforcement including supplementary crossties having a spacing of s_h and crossing a section with a core dimension of h_c , square inches
b_w	= web width, or diameter of circular section, inches
d	= distance from extreme compression fiber to centroid of tension reinforcement, inches
d_c	= dimension of the column core in the direction of load, inches
d_b	= nominal diameter of bar, inches
f'_c	= specified compressive strength of concrete, psi
f_y	= specified yield strength of nonprestressed reinforcement, psi
f_{yh}	= specified yield strength of hoop reinforcement, psi
h_c	= core dimension of rectangular tied column, inches
P_e	= maximum design axial load on a column during an earthquake
P_u	= design axial load strength
ρ	= ratio of nonprestressed tension reinforcement (A_s/bd)
ρ'	= ratio of nonprestressed compression reinforcement (A'_s/bd)
s_h	= center to center spacing of hoops, inches
V_d	= applied shear force at section due to dead load
V_l	= applied shear force at section due to live load
V_u	= total applied design shear force at section

91.2622.4 Physical Requirements for Concrete and Reinforcing Steel.

91.2622.4.1 Concrete. The minimum specified 28-day strength of the concrete, f'_c , shall be 3000 psi.

The maximum specified strength for lightweight concrete shall be limited to 4000 psi.

91.2622.4.2 Reinforcement. All longitudinal reinforcing steel in columns and beams shall comply with ASTM A-615, grade 40 or 60. The actual yield stress, based on mill tests, shall not exceed the minimum specified yield stress, f_y , by more than 18,000 psi. Retests shall not exceed this value by more than an additional 3000 psi. In addition, the ultimate tensile stress shall be not less than 1.33 times the actual yield stress, based on mill

tests. Grades other than these specified for design shall not be used.

Where reinforcing steel is to be welded, a chemical analysis of the steel shall be provided. The welding procedure and allowable stresses shall be in accordance with the provisions of Section 91.2607.

91.2622.5 Flexural Members.

91.2622.5.1 General. Flexural members shall not have a width-depth ratio of less than 0.3, nor shall the width be less than 10 inches nor more than the supporting column width plus a distance on each side of the column equal to three-fourths the depth of the flexural member. Flexural members framing into columns shall be subject to a rational joint analysis.

91.2622.5.2 Reinforcement. All flexural members shall have a minimum reinforcement ratio, for top and for bottom reinforcement, of $\frac{200}{f_y}$ throughout their length. The reinforcement ratio, ρ , shall not exceed 0.025.

The positive moment capacity at the face of columns shall be not less than 50 percent of the negative moment capacity provided. A minimum of one-fourth of the larger amount of the negative reinforcement required at either end shall continue throughout the length of the beam. At least two bars shall be provided both top and bottom.

91.2622.5.3 Splices. Tensile steel shall not be spliced by lapping in a region of tension or reversing stress unless the region is confined by stirrup-ties. Splices shall not be located within the column or within a distance of twice the member depth from the face of the column. At least two stirrup-ties shall be provided at all splices.

91.2622.5.4 Anchorage. Flexural members terminating at a column, in any vertical plane, shall have top and bottom reinforcement extending, without horizontal offsets, to the far face of a confined concrete region (Section 91.2622.8.4) terminating in a standard 90 degree hook. Length of required anchorage shall be computed beginning at the near face of the column. Length of anchorage in confined regions, including hook and vertical extension, shall be not less than 56 percent of the development length determined in accordance with ACI-318 section 12.5 but not less than 24 inches.

EXCEPTION: Where the column resists less than 25 percent of the story-bent shear, at least 50 per cent of such top and bottom reinforcement shall be anchored within such column cores and the remainder shall be anchored in regions outside the column core confined as specified herein for columns.

91.2622.5.5 Web Reinforcement. Vertical web reinforcement of not less than No. 3 bars shall be provided in accordance with the requirements of ACI-318, except that:

91.2622.5.5.1 Web reinforcement shall be provided to develop the shears resulting from shear forces at the end of the member computed by:

$$V_u \geq \frac{M_a + M_b}{l} + 1.4 (V_d + V_l) \quad (22-1)$$

Where M_a and M_b are the theoretical moment strengths of opposite sense at each end of the member and $V_d + V_l$ is

the simple span shear at the ends of the member. The theoretical moment capacities shall be computed without the ϕ factor reduction and assuming the maximum reinforcing yield strength based on 25% over specified yield. Shear strength shall be computed with the ϕ factor reduction.

91.2622.5.5.2 Stirrups shall be spaced at no more than $d/2$ throughout the length of the member.

91.2622.5.5.3 Stirrup-ties, at a maximum spacing of not over $d/4$, eight bar diameters, 24 stirrup-tie diameters, or 12 inches, whichever is least, shall be provided in the following locations:

At each end of all flexural members. The first stirrup-tie shall be located not more than two inches from the face of the column and the last, a distance of at least twice the member depth from the face of the columns;

Wherever ultimate moment capacities may be developed in the flexural members under inelastic lateral displacement of the frame;

Wherever required compression reinforcement occurs in the flexural members.

91.2622.5.5.4 In regions where stirrup-ties are required, longitudinal bars shall have lateral support conforming to the provisions of ties for tied columns. Single or overlapping stirrup-ties and supplementary crossties may be used.

91.2622.6 Columns Subject to Direct Stress and Bending.

91.2622.6.1 Dimensional Limitations. The ratio of minimum to maximum column thickness shall not be less than 0.4 nor shall any dimension be less than 12".

91.2622.6.2 Vertical Reinforcement. The reinforcement ratio, ρ , in tied columns shall not be less than 0.01 nor greater than 0.06.

91.2622.6.3 Splices. Lap splices shall be made within the center half of column height, and the splice length shall not be less than 30 bar diameters. Continuity may also be effected by welding or by approved mechanical devices, provided not more than alternate bars are welded or mechanically spliced at any level and the vertical distance between these welds or splices of adjacent bars is not less than 24 inches.

91.2622.6.4 Special Transverse Reinforcement. The cores of columns shall be confined by special transverse reinforcement as specified herein or as required to meet shear requirements.

91.2622.6.4.1 The volumetric ratio of spiral reinforcement shall not be less than that required in equation (10-3) of ACI-318 nor

$$0.12 \frac{f'_c}{f_{yh}}$$

whichever is greater.

91.2622.6.4.2 The total cross-sectional area (A_{sh}) of rectangular hoop reinforcement shall not be less than the greater of

$$0.30 s_h h_r \frac{f'_c}{f_{yh}} \left(\frac{A_g}{A_{ch}} - 1 \right) \quad (22-2)$$

or

$$0.12 s_h h_r \frac{f'_c}{f_{yh}} \quad (22-3)$$

The center-to-center spacing of hoops, s_h , shall not exceed 4 inches.

Single or overlapping hoops may be provided to meet this requirement.

Supplementary crossties of the same size and spacing as hoops using 135° minimum hooks engaging the periphery hoop and secured to a longitudinal bar may be used. Supplementary crossties or legs of overlapping hoops shall not be spaced more than 14" on center transversely.

EXCEPTION: Equation (22-2) need not be complied with if the column design is based on the column core only.

91.2622.6.4.3 Special transverse reinforcement shall be provided in that portion of the column over a length equal to the maximum column dimension or one-sixth of the clear height of the column, but not less than 18 inches from either face of the joint.

91.2622.6.4.4 At any section where the design axial load strength of the column is less than the sum of the shears (ΣV_u) computed by Equation (22-1) for all the beams framing into the column above the level under consideration, special transverse reinforcement shall be provided. For beams framing into opposite sides of the column, the moment components of Equation (22-1) may be assumed to be of opposite sign. For the purpose of this determination the factor of 1.4 in Equation (22-1) may be changed to 1.1. For determination of the column axial load, the moments resulting from Equation (22-1) may be assumed to result from deformation in any one principal axis.

91.2622.6.4.5 Columns which support discontinuous members, such as shear walls, braced frames, or other rigid elements shall have special transverse reinforcement for the full height of the supporting columns.

91.2622.6.5 Column Shear. The transverse reinforcement in columns subjected to bending and axial compression shall satisfy the following requirement:

$$A_v f_y \frac{d_c}{s} = \frac{V_u}{\phi} - V_c$$

WHERE

V_u , the maximum design shear, shall be computed by using the yield moments in the ends of either the beams or columns framing into the connection. Yield moments shall be computed without ϕ or other reduction factors and under all possible vertical loading conditions and assuming the maximum reinforcing yield strength based on 25% over specified yield. Shear strength shall be based on the column core area.

$V_c = v_c A_{ch}$ where v_c shall be in accordance with Section 11.4 of ACI-318, except that v_c shall be considered

zero when $\frac{P_e}{A_g} < 0.12 f'_c$.

(A_{ch} as defined in Section 91.2622.3)

s = spacing, $\leq \frac{1}{2}$ minimum column dimension.

d_c = dimension of column core in direction of load.

A_v = total cross sectional area of special transverse reinforcement in tension within a distance(s), except that two-thirds of such area shall be used in the case of circular spirals.

91.2622.7 Beam-Column Connection. Special transverse reinforcement shall be provided through the beam column connection.

91.2622.7.1 Analysis. The transverse reinforcement through the connection shall be proportioned according to the requirements of Section 91.2622.6.4. The transverse reinforcement thus selected shall be checked according to the provisions set forth in Section 91.2622.6.5 with the exception that the V_u acting on the connection shall be equal to the maximum shears in the connection computed by a rational analysis taking into account the column shear and the concentrated shears developed from the forces in the beam reinforcement at a stress assumed at f_y .

91.2622.7.2 Special transverse column reinforcement of one-half the amount otherwise required by Subsection 91.2622.7.1 shall be required within the connection, determined by the depth of the shallowest framing member, where such members frame into all four sides of a column and whose width is at least three-fourths the column width. When a corner of a tied column, unconfined by flexural members, exceeds 4 inches, the full special transverse reinforcement shall be provided through the connection and around bars outside of the connection.

91.2622.7.3 Special transverse beam reinforcing shall be provided through the beam-column connection to provide confinement for longitudinal reinforcement outside the column core where such confinement is not provided by another beam framing into the connection.

91.2622.7.4 Design Limitations. At any beam-column connection where

$$\frac{P_e}{A_g} \geq 0.12f'_c$$

the sum of the moment strengths of the column, at the design earthquake axial load, shall be greater than the sum of the moment strengths of the beams, along their principal planes at that connection.

EXCEPTION: Where certain beam-column connections at any level do not comply with the above limitations, the remaining columns and connected flexural members shall comply and further shall be capable of resisting the entire shear at that level accounting for the altered relative rigidities and torsion resulting from the omission of elastic action of the non-conforming beam-column connections.

SEC. 91.2623 — CONCRETE SHEAR WALLS AND BRACED FRAMES

91.2623.1 General.

91.2623.1.1 Design and construction of earthquake resisting reinforced concrete shear walls and reinforced concrete braced frames subjected primarily to axial stresses shall conform to the requirements of this Section.

91.2623.1.2 Shear walls and braced frames shall be designed by the strength design method except that the alternate design method may be used, provided that the factor of safety in shear and diagonal tension is equivalent to that achieved with the strength design method.

91.2623.1.3 The equations shown in ACI-318 for earthquake loading shall be modified to:

$$U = 1.4 (D + L) + 1.4E$$

$$U = 0.9D + 1.4E$$

➤ provided further that, 2.0 E shall be used in both equations in calculating shear stresses in shear walls of buildings without a 100 percent moment-resisting space frame. ◀

91.2623.1.4 Columns which support discontinuous members, such as shear walls, braced frames, or other rigid elements, shall have special transverse reinforcement in accordance with Section 91.2622.6.4 for the full height of the supporting columns.

91.2623.2 Braced Frames. Reinforced concrete members of braced frames subjected primarily to axial stresses in buildings with a ductile moment resisting space frame shall have special transverse reinforcing as set forth in Section 91.2622.6.4 throughout the full length of the member. Tension members shall additionally meet the requirements for compression members.

91.2623.3 Shear — Strength Design

91.2623.3.1 The nominal total design shear stress resulting from forces acting parallel to shear walls shall be computed by:

$$v_u = \frac{V_u}{\phi A_c}$$

Where

V_u = Total applied design shear force computed according to Subsection 91.2305(e) and 91.2623.1.3 including the effect of gravity loads.

A_c = Area of concrete sections resisting V_u , sq. in.

91.2623.3.2 The nominal total design shear stress, v_u , thus computed shall not exceed that given by:

$$v_u = 2 \phi \sqrt{f'_c} + \phi \rho f_y$$

Where ρ is the ratio of the area of reinforcement to the area of concrete section resisting the shear V_u . At least an equal percentage of reinforcement, ρ , shall be provided perpendicular to that required by this Subsection.

The average nominal horizontal shear, v_u for all wall piers sharing a common lateral force component shall not exceed $8 \phi \sqrt{f'_c}$ and the v_u in any of the individual wall piers shall not be more than $10 \phi \sqrt{f'_c}$.

The value of the vertical shear, v_u , shall not exceed $10 \phi \sqrt{f'_c}$ for horizontal wall elements.

91.2623.3.3 The minimum reinforcing ratio ρ for all walls designed to resist Code seismic forces acting parallel to the wall shall be .0025 each way. The maximum spacing of reinforcement each way shall not exceed $d/3$ or 18", whichever is smaller, where "d" is the dimension of the wall element parallel to the shear force. That portion of the wall reinforcement required to resist design shears shall be uniformly distributed.

91.2623.3.4 Wall reinforcement required to resist wall shear shall be terminated with not less than a 90° bend plus a 6 bar diameter extension beyond the boundary reinforcing at vertical and horizontal end faces of wall sections. Wall reinforcement terminating in boundary columns or beams shall be fully anchored into the boundary elements.

91.2623.4 Vertical Boundary Elements — For Buildings with Ductile Moment-Resisting Space Frames.

91.2623.4.1 Vertical boundary elements shall be provided at the edges of concrete shear walls and shall be composed of concrete encased structural steel elements of ASTM A36, A440, A441, A572 (except Grades 60 and 65), A588 or shall be concrete reinforced as required for columns in Section 91.2622.6 with special transverse reinforcement as described in Subsection 91.2622.6.4 for the full length of the element.

91.2623.4.2 The boundary vertical elements and such other similar vertical elements as may be required shall be designed to carry all the vertical stresses resulting from the wall loads in addition to tributary dead and live loads and from the horizontal forces as prescribed in Section 91.2305. Horizontal reinforcing in the walls shall be fully anchored to the vertical elements.

91.2623.4.3 Similar confinement of horizontal and vertical boundaries at wall openings shall also be provided unless it can be demonstrated that the unit compressive stresses at the opening have a load factor two times that indicated in Subsection 91.2623.1.3.

DIVISION 27 — STEEL

SEC. 91.2701 — GENERAL

(a) Scope. Except as specifically provided in this Division, the material and design of steel used structurally in buildings or structures shall conform to:

1. "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings" by the American Institute of Steel Construction as modified by the provisions of Section 91.2702 and 91.2703. Said Specification is hereinafter referred to as the AISC Specification.

2. "Specification for the Design of Cold-Formed Steel Structural Members" by the American Iron and Steel Institute with the exception that steel regulated by this Specification shall be limited to $\frac{1}{4}$ inch maximum thickness. Said specification is hereinafter referred to as the AISI Specification.

Deviations from the AISC Specification or the AISI Specification as allowed by statements contained therein such as: "authorized by", "approved", or "permitted by the Engineer", shall require approval by the Department of such deviation prior to use.

(b) Identification. All steel, including second-hand steel, shall be tested for conformance to applicable specifications as listed in Subsection (a) of this Section. Mill tests are acceptable if the material is positively identified.

EXCEPTION: Where positive identification of the steel is not possible, tests shall not be required for steel in which the working stresses are not more than 50 percent of the minimum allowable stress specified in this Division for steel conforming to ASTM A36.

(c) Corrosion Resistance. All steel 3/16-inch or less in thickness which is exposed to the weather shall be corrosion resistant steel designated ASTM A242 or A588, with the further provision that details of the method used to prevent standing water shall be submitted to the Department for approval; or steel shall be made corrosion resistant by a coating of nonferrous metal or other coating approved by the Department.

SEC. 91.2702 — MODIFICATIONS AND SUPPLEMENTS TO THE AISC SPECIFICATION

(a) General. 1. This specification is not applicable to the design and fabrication of structural members cold-formed to shape from carbon or low-alloy sheet or strip steel $\frac{1}{4}$ -inch or less in thickness.

2. All references to the American Welding Society's (AWS) "Code for Welding in Building Construction," D1.0 and "Specifications for Welded Highway and Railroad Bridges," D2.0 shall refer to the applicable section of AWS D1.1, "Structural Welding Code."

(b) Specific Modifications and Supplements to the AISC Specification. (AISC Section numbers are used herein.)

1. Sections 1.1, 1.2, and 1.3 are not adopted.

2. Subdivision 1.4.1.1. is modified as follows:

"High-Yield Strength Quenched and Tempered Alloy Steel Plate, Suitable for Welding," ASTM A514 may be used only in specific locations as approved by the Department. "Line Pipe, Grade 'A' or 'B'," API 5-L is permitted. The last paragraph is not adopted. See Section 91.2701 for Identification.

3. Subdivision 1.4.1.2 is not adopted. See 91.2701(b).

4. Subsection 1.5.3 is modified by the addition of footnote No. 5 to Table 1.5.3 as follows:

(5) Welding which employs design stresses exceeding 50 percent of the values in Table 1.5.3 shall be continuously inspected by a Registered Deputy Building Inspector unless performed on the premises of an approved fabricator.

5. Subsection 1.5.5 and 1.5.6 are not adopted. The applicable provisions are in Divisions 23, 24 and 26.

6. Subsection 1.7.2 is modified by the addition of the following:

Stresses produced by horizontal forces required by Division 23 need not be included as a requirement for this Subsection.

7. Subsection 1.11.4 is modified by the addition of the following:

Mechanical requirements and installation of steel stud shear connectors shall conform to the provisions of Section 4, Part VI of AWS D1.1.

The type of shear connector, method of connection, and inspection requirements shall be approved by the Department. Values given in Table 1.11.4 shall be limited to connectors specifically approved by the Department.

8. Subsection 1.13.1 is replaced by the following:

Deflection. The deflection of flat roofs shall be limited to that specified in Section 91.2301(i).

9. Subsection 1.15.8, paragraph 1 is modified as follows:

Where columns bear on bearing plates, or are finished to bear at splices, there shall be sufficient rivets, bolts, or welds to hold all parts securely in place and to transfer a minimum of 10 percent of the axial compressive force in the column.

10. Section 1.15 is modified by adding the following new Subsection:

1.15.13 Adjustable Tension Members. Adjustable tension members shall be tightened sufficiently to remove any sag.

11. Subsection 1.17.1 is not adopted and the following Subsection 1.17.1 is added:

1.17.1 General.

1.17.1.1 All welds used in the connections between structural members shall comply with the "Code for Welding in Building Construction," AWS D1.1, of the American Welding Society and such other requirements as set forth in this Code.

All welding, except when performed at the shop of an approved fabricator, [see Section 91.0310(g)], shall be done by operators certified by the Department for the type of operation involved in accordance with the provisions of Section 91.0312.1.

1.17.1.2 Welding shall be limited to base metals specified in Table 1.5.3. Electrodes or flux used in welding shall be as specified in Tables 1.5.3 and 1.17.2.

1.17.1.3 Complete details of location, type, size and extent of all welds shall be clearly shown on the plans. Where symbols are used on the plans, they shall be the "Standard Welding Symbols," AWS A2.0, of the American Welding Society. When it is necessary to use a special erection sequence of welding to minimize locked-up stresses or distortion, the Department may require such erection sequence of welding to be shown on the plans.

12. Subsection 1.17.2, paragraph 2 is modified as follows:

Joint forms, details, welding processes, or welding procedures other than those included in the foregoing may be employed, provided they shall have been qualified in accordance

with the requirements of AWS D1.1 and such other tests as the Department may require to simulate job conditions and to limit the material thicknesses qualified. Each application for Department approval of a welding procedure qualification test shall be accompanied by a fee of \$40.00.

13. Subsection 1.17.4 is not adopted and the following Subsection 1.17.4 is added:

Subsection 1.17.4. Weld metal deposited by the electroslag or electrogas welding process shall conform to the requirements of Subsection 4.20 of AWS D1.1.

14. Sections 1.19 and 1.20 are not adopted.

15. Subsection 1.21.2 is modified as follows:

Column bases shall be set level and to correct elevation with full bearing on the supporting material.

16. Subsection 1.23.5, paragraph 5 is not adopted and the following is adopted in place of paragraph 5:

Bolts shall be tightened to a bolt tension not less than the proof load given in the applicable ASTM Specification for the type of bolt used.

Bolts shall be installed with a hardened washer under the nut or bolt-head, whichever is the element turned in tightening.

Continuous inspection by a Registered Deputy Building Inspector shall be provided for all connections and faying surfaces where high-strength bolts are used unless:

(a) High-strength bolts are specified, but design stresses are within the allowable stress range of A307 bolts.

(b) High-strength bolts are designed as tension connectors only and resist little or no shearing stress.

A sufficient number of bolts shall be torque tested after installation using a "Calibrated Manual Torque Wrench" as specified in the "Specification for Structural Joints using ASTM or A325 or A490 Bolts" to assure required tensioning is being obtained.

17. Subsection 1.23.6 is not adopted and the following Subsection 1.23.6 is added:

Subsection 1.23.6. **Welded Construction.** The technique of welding employed, the appearance and quality of welds made, and the method used in correcting defective welds shall conform to Section 3, "Workmanship," and Section 4, "Technique," of the "Code for Welding in Building Construction," AWS D1.1.

EXCEPTIONS: 1. Undercutting shall be limited as specified in Subdivision 3.6.4 of AWS D1.1, provided further that in no case shall the amount of undercut exceed five percent of the thickness of the base material having a thickness of 3/16-inch or less.

2. Tolerances for flatness of girder webs may be in accordance with the following in lieu of paragraph 3.5.1.5 of AWS D1.1.

A. The maximum deviation from flatness of webs (dish) in the length between stiffeners or in a length equal to the depth of the member at the section under consideration shall not exceed the following:

Dimension	Maximum Deviation From Flatness
Less than 25"	1/50 of the dimension
25" to 75"	1/2"
over 75"	1/150 of the dimension

B. In lieu of the values specified in ASTM A6 the maximum deviation below the specified depth shall be as follows:

For depths up to and including 36 inches—1/8-inch
For depths exceeding 36 inches—3/16-inch

18. Sections 1.24, 1.25, and 1.26 are not adopted.

19. Section 2.1, paragraph 2, is modified as follows:

Connections joining a portion of a structure designed on the basis of plastic behavior with a portion not so designed need be no more rigid than ordinary seat-and-cap angle or standard web connections.

20. Section 2.1, last paragraph, is not adopted and the following last paragraph is added:

Portions of a structure which are a part of the required lateral force resisting system shall not be designed on the basis of plastic design, nor shall crane runways be designed continuous over interior vertical supports on the basis of maximum strength. However, rigid frame bents supporting crane runways may be considered as within the scope of this Division.

21. Section 2.3 is not adopted.

SEC. 91.2703 — STEEL DUCTILE MOMENT-RESISTING SPACE FRAMES

(a) **General.** The design and construction of steel framing in ductile moment-resisting space frames shall conform to the requirements of this Section and all other applicable requirements of the Code. Welding shall comply with the requirements of Section 1.23.6 of this Division.

(b) **Definitions.**

1. **Joint.** A joint is the entire assemblage at the intersection of two or more members.

2. **Connection.** A connection consists of only those elements that connect a member to a joint.

(c) **Materials.** Structural steel shall conform to A36, A242, A440, A441, A572 (Grades 42, 45, 50 and 55), or A 588.

EXCEPTION: Structural steel A283 Grade D may be used for base plates and anchor bolts.

(d) **Connections.** Each beam or girder moment connection to a column shall be capable of developing in the beam the full plastic capacity of the beam or girder.

EXCEPTION: The connection need not develop the full plastic capacity of the beam or girder if it can be shown that adequate ductile joint displacement capacity is provided with a lesser connection.

For steel whose specified ultimate strength is less than $1\frac{1}{2}$ times the specified yield strength, plastic hinges in beams formed during inelastic deformations of the frame shall not occur at locations in which the beam flange area has been reduced by holes for bolts or rivets, or by any other manner.

(e) **Local Buckling.** Members in which hinges will form during inelastic displacement of the frames shall comply with the requirement for "plastic design sections."

(f) **Slenderness Ratios.** The effective length "KL" used in determining the slenderness ratio of an axially loaded compression member in a ductile moment-resisting space frame shall be based on the assumption that the frame depends on its own bending stiffness for lateral stability and shall disregard the effect of any bracing or shear walls.

(g) **Nondestructive Weld Testing.** Tension groove-welded connections between primary members of the ductile moment-resisting space frame shall be tested by nondestructive methods for compliance with this Division and job specifications. A program for this testing shall be established by the person responsible for the structural design.

DIVISION 28 — FOUNDATION AND RETAINING WALLS

SEC. 91.2801 — GENERAL

(a) **Definitions.** For the purpose of this Division, certain terms are defined as follows:

Cast-In-Place-Pile. A concrete column cast in place without forms in an excavation.

Clay. A fine grained inorganic soil possessing sufficient cohesion when dry to form hard lumps which cannot readily be pulverized under finger pressure and when moist can be rolled into threads $\frac{1}{8}$ inch in diameter, three inches long, which will support their own weight when suspended.

Compact Gravel, Compact Sand, And Compact Silt. Deposits requiring picking or difficult hand shoveling for removal.

Expansive Soil. A fine grained cohesive soil undergoing large volume changes with changes in moisture content, and when dry, cracking into wide, deep blocks. The laboratory criterion for expansive soil shall be that a laterally confined undisturbed sample of soil or a sample compacted to 90% of the maximum density shall expand at least 5% from air dry at 100 degrees Fahrenheit to saturation while under a normal load equivalent to 400 pounds per square foot.

Fine Sand. Sand consisting chiefly of grain sufficiently large to be retained upon a No. 270 mesh sieve but passing a No. 60 mesh sieve.

Footing. That portion of a structure which rests upon the foundation. Piles, caissons and piers shall be considered a portion of the footing.

Foundation. The ground upon which a structure is supported.

Gravel. An uncemented mixture of mineral grains $\frac{1}{4}$ inch or more in diameter.

Ground. The materials of the earth.

Inorganic Loam. A mixture of sand and silt in nearly equal proportions, with small amounts of clay.

Inorganic Silt. A fine grained inorganic soil consisting chiefly of grains passing No. 270 mesh sieve, and forming lumps when dry, which can be pulverized by the fingers, and when wet cannot be rolled into thin threads which will support their own weight when suspended.

Loose Gravel, Loose Sand, And Loose Silt. Deposits easily removable by hand shoveling.

Metal-Cased Pile. Concrete pile in a driven metal casing.

Peat. Peat, humus and swamp soils with a highly organic texture and generally containing fibrous vegetable matter.

Per Cent Compaction shall mean the dry density of the material as present in the fill divided by the maximum dry density as determined in accordance with ASTM Designation D1557.

Pile. Column inserted into a foundation.

Sand. An uncemented mixture of mineral grains less than $\frac{1}{4}$ inch in diameter and retained on a No. 270 mesh sieve.

Soft Clay. A clay which, when freshly sampled, can readily be molded by light finger pressure.

Stiff Clay And Stiff Silt. A clay or silt which can be removed

by either picking or hard hand shoveling but which is difficult to mold by finger pressure.

Underpinning. Footing introduced beneath an existing footing.

(b) **Fills and Excavations.** No fills or excavations shall be made in such a manner as to increase the stresses in or the pressure upon the foundation of any building or structure beyond those permitted by this Code. (See Section 832 of the Civil Code of California for Rights of Coterminous Owners as to Excavations.)

SEC. 91.2802 — FOUNDATION ANALYSIS

(a) **General.** The classification of the foundation material under every building shall be based upon the examination of test borings or excavations made at the site. The extent and number of the test borings or excavations shall be sufficient to provide the data necessary to classify the foundation materials under the entire building. The location of the test borings or excavations and the nature of the subsurface materials shall be indicated on the plans.

***EXCEPTION:** The requirements of this Subsection shall not apply to any building constructed in accordance with the arbitrary requirements of Division 48 (Wood Frame Dwellings).*

(b) **Foundation Materials.** The foundation of every structure shall be a uniform natural deposit of rock, gravel, sand, clay, silt or combination thereof which does not contain and which does not overlie strata containing more than 10% by dry weight of organic matter.

***EXCEPTION:** Foundations may be artificial fill or nonuniform areas of dissimilar materials, provided due allowance is made for the effect of differential settlement.*

(c) **Effect of Change in Moisture Content.** Due allowance shall be made in determining the capacity of foundations for the effect of possible change in moisture content.

(d) **Effect of Pressure on Foundations.** Where footings are to be placed at varying elevations or at different elevations from existing footings, the effect of adjacent loads shall be included in the foundation analysis.

(e) **Load Distribution.** A load upon a foundation stratum shall be assumed as distributed uniformly over an area subtended by planes extending downward from the edges of the footing and making an angle of 60 degrees with the horizontal.

(f) **Arbitrary Design Specification.** Certain buildings of Type V construction may have footings and foundations designed in accordance with the provisions of Section 91.1708 (Type V Buildings) and Section 91.4807 (Wood Frame Dwellings).

SEC. 91.2803 — FOUNDATION CLASSIFICATION

(a) **Foundation Classification.** Foundation materials shall be grouped in classes having the designations set forth in Table No. 28-A.

(b) **Variation in Soil Strata.** The classification of foundation material shall be that of the weakest stratum within a depth below the footing equal to twice the least width of the footing.

TABLE NO. 28-A — ALLOWABLE FOUNDATION PRESSURE
(Kips per Square Foot — 1 Kip = 1,000 pounds)

CLASS OF MATERIAL			
Rock—Depth of Embedment shall be to a Fresh Unweathered Surface Except as Noted	Value at Min. Depth	Increase for Depth	Maximum Value
*Massive crystalline bedrock; basalt, granite and diorite in sound condition.....	20		20
*Foliated rocks; schist and slate, in sound condition	8		8
*Sedimentary rocks; hard shales, dense siltstones and sandstones, thoroughly cemented conglomerates	6		6
Soft, or broken bedrocks; soft shales, shattered slates, diatomaceous shales; other badly jointed (fractured) or weathered rock. 12" minimum embedment	2		2

*NOTE: The above values apply only where the strata are level or nearly so, and/or where the area has ample lateral support. Tilted strata, and the relationship to nearby slopes should receive special consideration. These values may be increased one-third to a maximum of two times the assigned value, for each foot of penetration below fresh, unweathered surface.

Soils—Minimum Depth of Embedment shall be one foot below the adjacent undisturbed ground surface*					In-crease for Depth	Max-imum Value
	Loose	Com-pact	Soft	Stiff		
Gravel, well graded. Well graded gravels or gravel-sand mixtures, little or no fines	1.33	2.0			20	8
Gravel, poorly graded. Poorly graded gravels or gravel-sand mixtures, little or no fines	1.33	2.0			20	8
Gravel, silty. Silty gravels or poorly graded gravel sand silt mixtures.....	1.0	2.0			20	8
Gravel, clayey. Clayey gravels or gravel-sand clay mixtures.....	1.0	2.0			20	8
Sand, well graded. Well graded sands or gravelly sands, little or no fines....	1.0	2.0			20	6
Sand, poorly graded. Poorly graded sands or gravelly sands, little or no fines	1.0	2.0			20	6
Sand, silty. Silty sand, or poorly graded sand-silt mixtures	0.5	1.5			20	4
Sand, clayey. Clayey sands or sand-clay mixtures	1.0	2.0			20	4
Silt, inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity.....	0.5	1.0			20	3
Silt, organic. Organic silts and organic silt-clays of low plasticity.....	0.5	1.0	0.5	1.0	10	2
Silt, elastic. Very compressible silts, micaceous or diatomaceous fine sandy or silty soils.....	0.5	1.0			10	1.5
Clay, lean. Inorganic clays of low to medium plasticity, silty clays, lean clays	1.0	2.0	1.0	2.0	20	3
Clay, fat. Very compressible clays, inorganic clays of high plasticity.....			0.5	1.0	10	1.5
Clay, organic. Organic clays of medium to high plasticity, very compressible.....			0.5			0.5
Peat. Peat and other highly organic swamp soils			0			0

NOTES:

1. Values for gravels and sand given are for footings one foot in width and may be increased in direct proportion to footing width to maximum of three times the maximum value, or to the designated maximum value, whichever is the least.
2. Where the bearing values in the above table are used, it should be noted that increased width or unit load will cause increase in settlement.
3. Special attention should be given to the effect of increase in moisture in establishing soil classifications.
- *4. Minimum depth for highly expansive soils to be one and one-half feet.
5. Increases for depth are given in percentage of minimum value for each additional foot below the minimum required depth.

TABLE NO. 28-B — ALLOWABLE FRICTIONAL & LATERAL BEARING VALUES FOR ROCK¹

Type	Friction Coefficient	Allowable Lateral Bearing	
		lbs. per sq. ft. per ft. of depth	Max. Value
Massive Crystalline Bedrock	1.0	4,000	20,000
Foliated Rocks	.8	1,600	8,000
Sedimentary Rocks	.6	1,200	6,000
Soft or Broken Bedrocks	.4	400	2,000

ALLOWABLE FRICTIONAL & LATERAL BEARING VALUES FOR SOILS

Frictional Resistance — Gravels and Sands ¹	
Soil Type	Friction Coefficient
Gravel, Well Graded	0.6
Gravel, Poorly Graded	0.6
Gravel, Silty	0.5
Gravel, Clayey	0.5
Sand, Well Graded	0.4
Sand, Poorly Graded	0.4
Sand, Silty	0.4
Sand, Clayey	0.4

1. Coefficient to be multiplied by the Dead Load.

ALLOWABLE FRICTIONAL RESISTANCE (lbs. per sq. ft.) — Clay and Silt¹

Soil Type	Loose or Soft	Compact or Stiff
Silt, Inorganic	250	500
Silt, Organic	250	500
Silt, Elastic	200	400
Clay, Lean	500	1000
Clay, Fat	200	400
Clay, Organic	150	300
Peat	0	0

2. Frictional values to be multiplied by the width of footing subjected to positive soil pressure. In no case shall the frictional resistance exceed $\frac{1}{2}$ the dead load on the area under consideration.

ALLOWABLE LATERAL BEARING PER FT. OF DEPTH BELOW NATURAL GROUND SURFACE (lbs. per sq. ft.) (Natural Soils or approved compacted fill)

Soil Type	Loose or Soft	Compact or Stiff	Max. Values
Gravel, Well Graded	200	400	8000
Gravel, Poorly Graded	200	400	8000
Gravel, Silty	167	333	8000
Gravel, Clayey	167	333	8000
Sand, Well Graded	183	367	6000
Sand, Poorly Graded	77	200	6000
Sand, Silty	100	233	4000
Sand, Clayey	133	300	4000
Silt, Inorganic	67	133	3000
Silt, Organic	33	67	2000
Silt, Elastic	33	67	1500
Clay, Lean	267	967	3000
Clay, Fat	33	167	1500
Clay, Organic	33	-----	500
Peat	0	0	0

GENERAL CONDITIONS OF USE

1. Frictional and lateral resistance of soils may be combined, provided the lateral bearing resistance does not exceed $\frac{2}{3}$ of allowable lateral bearing.
2. A $\frac{1}{2}$ increase in frictional and lateral bearing values will be permitted to resist loads caused by wind pressure or earthquake forces.
3. Isolated poles such as flag poles or signs may be designed using lateral bearing values equal to two times the tabulated values.
4. Lateral bearing values are permitted only when concrete is deposited against natural ground or compacted fill, approved by the Superintendent of Building.

(c) **Allowable Foundation Pressures.** The design unit pressure upon every foundation shall not exceed the arbitrary values exhibited in Table No. 28-A.

EXCEPTION: The tabulated values may be modified as prescribed in Section 91.2804.

(d) **Friction and Lateral Soil Pressures.** The design unit values for friction and lateral soil pressures shall not exceed the arbitrary values exhibited in Table No. 28-B.

EXCEPTION: The tabulated values may be modified as prescribed in Section 91.2804.

SEC. 91.2804 — SPECIAL FOUNDATION INVESTIGATION

(a) **Requirements.** Whenever, in the opinion of the Superintendent of Building, the adequacy and class of a foundation cannot be determined by the test borings or excavations required by the provisions of Section 91.2802 (a), he may require a special foundation investigation before approving the use of the foundation.

When the Department of Building and Safety considers a geological exploration necessary, such exploration shall be made by a Registered Certified Engineering Geologist.

(b) **Deviations.** Values in excess of the arbitrary allowable foundation values exhibited in Tables No. 28-A and 28-B shall be permitted only after performance of a special foundation investigation by an agency acceptable to the Department. The Department shall approve such deviations only after receiving a written opinion from the investigating agency together with substantiating evidence. A fee as indicated in Section 91.0212 shall be charged for processing the report.

(c) **Stresses.** Stresses and deformations within the foundations shall be determined by the general principles of soil mechanics.

SEC. 91.2805 — DESIGN OF FOOTINGS

(a) **Load Distribution.** Only vertical concentric loads shall be assumed to be distributed uniformly over the foundation area in contact with the footing.

Distribution of eccentric loads shall be based upon the assumption of a rigid footing and an elastic foundation.

(b) **Structural Design.** Except for special provisions of Section 91.2807 covering the design of piles, all portions of footings shall be designed in accordance with the structural provisions of this Code.

Footings shall be designed to minimize differential settlement.

(c) **Material.** All footings shall be of masonry or concrete except where a structure is supported on piles in conformity with this Division.

SEC. 91.2806 — PROTECTIVE COVERING OF STRUCTURAL STEEL SHAPES IN FOOTINGS

All structural steel shapes used in footings shall have at least six inches of concrete between the steel section and the upper foundation surface and shall be protected with at least four inches of concrete at all other points.

EXCEPTION: Structural steel shapes or pipes may be used as piles without a protective covering of concrete.

SEC. 91.2807 — PILE CONSTRUCTION — GENERAL PROVISIONS

(a) **Distribution of Load.** The total load applied to a group of piles shall be assumed to be distributed uniformly over a horizontal area subtended by inclined planes tangent to the polygon circumscribing the pile group at the top of the bearing stratum and making an angle of 60 degrees with the horizontal.

(b) **Unit Vertical Pressures Below Piles.** Unit vertical pressures, at or below the points of the piles, produced by the loads upon all piles in a foundation shall not exceed the limits prescribed in Section 91.2803.

(c) **Equipment and Methods.** Equipment and methods used in placing piles shall be subject to the approval of the Superintendent of Building.

(d) **Spacing.** The center-to-center spacing of piles shall be neither less than 36 inches nor less than $2\frac{1}{2}$ times the mean diameter of the pile.

SEE RULE OF GENERAL APPLICATION #9-69 IN APPENDIX SECTION

SEC. 91.2808 — PILES

(a) **General.** The allowable axial and lateral loads on piles shall be determined by load tests or shall be based upon the results of a Special Foundation Investigation as provided for in Section 91.2804. A foundation investigation shall be made if required by the Superintendent of Building.

(b) **Group Action.** For piles obtaining their support from friction, the allowable single pile load shall be reduced when piles are driven in groups. The allowable axial load shall be determined by multiplying the capacity of a single pile by an efficiency factor as determined by the following formula or by any other method approved by the Superintendent of Building:
Efficiency =

$$1 - \frac{d}{\pi smn} \left[(n-1)m + (m-1)n + \sqrt{2} (m-1)(n-1) \right]$$

n = number of piles in a row

m = number of rows

d = diameter of pile

s = center-to-center spacing of piles

The perimeter of any friction pile group shall be not less than the sum of the perimeters of the individual piles, unless justified by the results of an investigation by an approved foundation agency.

(c) **Static Load Tests.** When the allowable axial load of a single pile is determined by load test, one of the following methods shall be used: 1. The allowable load shall not exceed 50% of the yield point under test load. The yield point shall be defined as that point at which an increase in load produces a disproportionate increase in settlement;

2. The allowable load shall not exceed $\frac{1}{2}$ of the load which causes a net settlement after deducting rebound, of .01 inch per ton of test load, which has been applied for a period of at least 24 hours;

3. The allowable load shall not exceed $\frac{1}{2}$ of that load under which, during a 40-hour period of continuous load application, no additional settlement takes place.

(d) **Dynamic Load Tests.** When determined by dynamic load

tests the allowable axial load on any pile shall not exceed $\frac{1}{4}$ of the resistance calculated from dynamic loading.

Methods of calculating pile resistance from dynamic loading shall be subject to approval by the Superintendent of Building and shall be based upon the assumption that the work done in overcoming resistance is equal to the energy of the driving device minus the losses due to inefficiency of the driving equipment, pile inertia, heat of impact and temporary deformations.

Determination of allowable axial load upon piles by calculation from dynamic loading shall be restricted to foundations where the average penetration for the first five blows immediately following a rest period of 24 hours does not increase more than 25% from the average penetration for the last five blows immediately prior to the rest period.

Test data shall be gathered and recorded as directed by the Superintendent of Building.

(e) **Column Action.** All piles standing unbraced in air, water, or material not capable of lateral support shall conform with the applicable column formula as specified in this Code. Such piles may be considered laterally supported at five feet below the surface of compact or stiff soils and at ten feet below the surface of loose or soft soils unless otherwise prescribed by the Superintendent of Building after a foundation investigation by an approved foundation agency.

(f) **Lateral Loads.** Lateral load capacity of piles shall be determined by either of the following methods: 1. Pile design. Assumed arbitrary fixity at five feet below compact or stiff soils and 10 feet below loose or soft soils:

2. Soil design. From results obtained by imposing lateral loads at the top of the pile. The lateral load capacity will be considered the load which will cause a deflection of $\frac{1}{4}$ inch at the ground line with 75% recovery. A factor of safety of two shall be used to determine the allowable working load.

EXCEPTION: Calculated lateral resistances may be based upon an investigation by an approved foundation agency.

(g) **Piles in Subsiding Areas.** Where piles are driven through subsiding fills or other subsiding strata and derive support from underlying firmer materials, consideration shall be given to the downward frictional forces which may be imposed on the piles by the subsiding upper strata.

(h) **Protection of Pile Materials.** Where the boring records of site conditions indicate deleterious action on pile materials because of soil constituents, changing water levels or other factors, such materials shall be adequately protected by methods or processes approved by the Superintendent of Building. The effectiveness of such methods or processes for the particular purpose shall have been thoroughly established by satisfactory service records or other evidence which demonstrates the effectiveness of such protective measures.

(i) **Structural Strength of Piles and Limiting Values of Stresses.** The allowable compressive stresses on all piling materials shall not exceed the values as specified below except that stresses may be increased on submission of satisfactory data for specially protected, selected, or high strength material.

1. Concrete — .225 f_c . Precast prestressed concrete piles (pre-tensioned) shall comply with Subsection (s) of this section.

2. Concrete cast-in-place friction piles, caissons, pile caps, and grade beams shall have an ultimate compressive strength f_c of not less than 2500 pounds per square inch.

3. Concrete placed in steel pipe piles—.25f_c'.

4. Structural Steel—12,000 pounds per square inch.

5. Wood—The allowable stress in compression parallel to the grain of round wood piles shall not exceed 60% of the basic stress for clear material as permitted in Division 25 of this Article and in no event shall the stress exceed 1,000 pounds per square inch.

6. Reinforcing steel shall conform to the requirements of Division 28 of this Article.

The full load shall be assumed as carried on the pile cross-section located at the upper surface of the soil supporting the pile.

(j) **Wood Piles.** 1. **Quality.** Every wood pile shall conform to the specification for Class A or Class B piles in "Specifications for Round Timber Piles", A.S.T.M. Designation D25.

2. **Preservatives.** Every wood pile shall be pressure-treated in accordance with the requirements of Division 31 of this Article.

EXCEPTION: Wood piles need not be pressure-treated, if cut off below the level of the lowest ground-water which may be assumed to exist during the life of the structure.

(k) **Precast Concrete Piles.** 1. **Quality.** Precast concrete piles shall be cast in one piece and prior to driving and at 28 days after pouring shall develop an ultimate compressive strength f_c' of at least 3,000 pounds per square inch.

2. **Reinforcement ties.** The longitudinal reinforcement in driven precast concrete piles shall be laterally tied with steel ties or wire spirals. Ties and spirals shall be spaced not more than three inches apart, center to center, for a distance of two feet from the ends and not more than six inches elsewhere.

The diameter of ties and spirals shall be not less than ¼ inch or No. 3 gage.

EXCEPTION: Spirals used in piles having a diameter of 16 inches or less may be of No. 5 gage wire and spirals used in piles having a diameter not greater than 20 inches may be of No. 4 gage wire.

3. **Diameter.** Precast concrete piles shall have a minimum diameter of six inches and an average diameter of not less than 10 inches.

(l) **Cast-in-Place Friction Piles.** 1. **Quality.** Concrete piles cast in place against earth in drilled or bored holes shall be made in such a manner as to insure the exclusion of any foreign matter in the concrete and to secure a full-sized shaft. The diameter of any such piles shall be not less than 1/20 of the length, except that the minimum diameter shall not be less than 12 inches and need not be more than 24 inches except as required by design stresses. Concrete shall have an ultimate compressive strength f_c' of not less than 2,500 pounds per square inch.

2. **Friction.** Any cast-in-place friction pile may be assumed to develop a frictional resistance equal to 1/6 of the maximum value at any depth stipulated in Table No. 28-A, but not to exceed 500 pounds per square foot, unless justified by the results of an investigation by an approved foundation agency, as specified in Section 91.2804. The weight of cast-in-place friction piles may be neglected in computing bearing capacity, except in uncompacted or subsiding soils.

(m) **Metal-Cased Concrete Piles.** 1. **Dimensions.** Every metal casing for a concrete pile shall have a sealed tip with a diameter

of not less than eight inches and shall have an average diameter of not less than 11 inches.

Concrete piles cast in place in metal shells shall have shells driven for their full length in contact with the surrounding soil and left permanently in place. The shells shall be sufficiently strong to resist collapse and sufficiently water tight to exclude water and foreign material during the placing of the concrete.

2. **Concrete.** All concrete used in metal-cased concrete piles shall have an ultimate compressive strength f_c' of not less than 2,500 pounds per square inch.

3. **Order of driving.** Piles shall be driven in such order and with such spacing as to insure against distortion of or injury to piles already in place. No pile shall be driven within $4\frac{1}{2}$ average pile diameters of a pile filled with concrete less than 24 hours old unless approved by the Superintendent of Building.

(n) **Concrete Filled Steel Pipe Piles.** 1. **Steel pipe.** Steel pipe piles shall conform to ASTM Designation A252.

2. **Concrete.** The concrete used in concrete filled steel pipe piles shall have an ultimate compressive strength f_c' of not less than 2,500 pounds per square inch.

(o) **Rolled Structural Steel Piles.** Structural steel piles shall conform to A.S.T.M. Designation A7 or A36.

(p) **Jetting.** Jetting shall not be used except where and as specifically permitted by the Superintendent of Building. When used, jetting shall be carried out in such a manner that the carrying capacity of existing piles and structures shall not be impaired. After withdrawal of the jet, piles shall be driven down until the required resistance is obtained.

(q) **Special Piles or Special Conditions.** The use of types of piles not specifically mentioned herein, and the use of piles under conditions not specifically covered herein may be permitted, subject to the approval of the Superintendent of Building, upon submission of acceptable test data, calculations and other information relating to the properties and load-carrying capacity of such piles.

(r) **Cast-in-Place Piers with Belled Bases (Belled Caissons).** Belled bases for cast-in-place piers shall be at least four inches thick at the edge of the required base and, unless the bell is reinforced, the conical surfaces shall slope at an angle of not less than 60 degrees from the horizontal. Shafts for such piers shall have a diameter not less than $1/15$ of the length. No shaft diameter need be greater than 24 inches except as required by design stresses and shall not be less than 16 inches except that for a length of eight feet or less, a diameter of 12 inches will be permitted.

The weight of cast-in-place piers and bases may be neglected in the computation for bearing capacity, except in unconsolidated or subsiding soils.

(s) **Precast Prestressed Concrete Piles (pretensioned).**

1. **Material.** Precast prestressed concrete piles shall develop a compressive strength of not less than 4,000 pounds per square inch before driving and an ultimate compressive strength " f_c " at 28 days after pouring of not less than 5,000 pounds per square inch.

2. **Reinforcement.** The longitudinal reinforcement shall be high tensile seven wire strand conforming to ASTM A416. Longitudinal reinforcement shall be laterally tied with steel ties or wire spirals.

Ties or spiral reinforcement shall be spaced not more than

three inches apart center to center for a distance of two feet from the ends, and not more than eight inches elsewhere.

At each end of the pile the first five ties or spirals shall be spaced one inch center to center.

For piles having a diameter of 24 inches or less, wire shall not be smaller than No. 5 gage. For piles having a diameter greater than 24 inches, but less than 36 inches, wire shall not be smaller than No. 4 gage. For piles having a diameter greater than 36 inches wire shall not be smaller than $\frac{1}{4}$ inch round or No. 3 gage.

3. Allowable stresses. Precast prestressed piling shall be designed to resist stresses induced by handling and driving as well as by loads. The effective prestress in the pile shall not be less than 400 pounds per square inch for piles up to 30 feet in length, 550 pounds per square inch for piles up to 50 feet in length, and 700 pounds per square inch for piles greater than 50 feet in length.

The compressive stress in the concrete due to externally applied load shall not exceed

$$f_c = 0.33 f'_c - 0.27 f_{pe}$$

WHERE:

" f_{pe} " is the effective prestress on the gross section. Effective prestress shall be based on an assumed loss of 30,000 pounds per square inch in the prestressing steel.

The allowable stress in the prestressing steel shall not exceed the values specified in American Concrete Institute Standard ACI-318.

SEC. 91.2809 — RETAINING WALLS

Retaining wall design shall conform to the requirements of Division 23 of this Article.

SEC. 91.2810 — UNDERPINNING

(a) General. In constructing underpinning, all portions of the structure shall be supported in such manner that no structural material is stressed beyond the yield point.

(b) Closure. ➤ All spaces between the existing footing and the underpinning shall be packed full of mortar conforming to the provisions of Section 91.2621.2 and having no slump when tested by the method specified in ASTM C143. ◀

SEC. 91.2811 — TEMPORARY EXCAVATIONS AND SHORING

(a) General. Excavations shall not remove the lateral support from a public way or from an existing structure. For the purpose of this Section, the lateral support shall be considered to have been removed when any of the following conditions exist:

1. The excavation exposes any adverse geological formations which would affect the lateral support of a public way or of an adjacent structure.

2. The excavation extends below a plane extending downward at an angle of 45 degrees from the edge of the public way.

EXCEPTION: Normal footing excavations not exceeding two feet in depth will not be construed as removing lateral support.

3. The excavation extends below a plane extending down-

ward at an angle of 45 degrees from the bottom of a footing of an existing structure.

(b) **Removal of Lateral Support.** Approval of the Department of Public Works shall be obtained prior to the issuance of a permit for any excavation which would remove the lateral support from a public way.

Excavations adjacent to an existing structure or a public way may exceed one horizontal to one vertical where either:

1. A foundation investigation by an approved soil testing agency recommending that the slope may be in excess of one to one has been approved by the Department, and by the Department of Public Works when the excavation is adjacent to a public way.

2. Temporary shoring is designed to support the excavation and plans are approved and a permit is issued by the Department.

A. Temporary shoring shall be designed for an earth pressure equivalent to that exerted by a fluid weighing not less than 30 pounds per cubic foot plus all surcharge loads or as recommended by a soils engineer and approved by the Department.

B. Soil bearing values shall be those specified in Division 28 of the Code or those recommended by a soils engineer and approved by the Department.

C. The design of the required temporary shoring and necessary underpinning shall include a sequence of construction and installation.

D. Allowable stresses used in the design of temporary shoring may be increased 33½ percent for structural and reinforcing steel and 25 percent for wood. No increase will be permitted for concrete. Other values shall be those prescribed by the Code.

This Section shall not be construed to waive the requirements of the General Safety Orders of the Department of Industrial Relations of the State of California.

DIVISION 29 — VENEERED WALLS

SEC. 91.2901 — GENERAL

(a) **Types of Veneer.** Veneer shall be either tied or adherent veneer.

(b) **Loads.** No veneer shall support any loading other than the weight of veneer.

(c) **Deviations.** Any deviations from details required by this Division shall be designed to provide equivalency with the provisions of this Division and shall be shown in detail on the plans submitted with the application for permit and shall be subject to approval by the Superintendent of Building. Consideration shall be given to differential movement of supports, including temperature changes, shrinkage, creep and deflection.

SEC. 91.2902 — TIED VENEER

(a) **Scope.** The provisions of this Section shall apply to approved veneer units of masonry, stone, tile, or terra cotta, laid with full bedded joints of cement mortar.

The thickness of tied veneer shall be not more than five inches nor less than $\frac{3}{4}$ inch. Buildings may be faced with slabs of terra cotta which, for the purpose of this Section, are defined as having more than 72 square inches of superficial area.

Walls to which terra cotta facing is to be applied by adhesion shall be rigid and free from oil. Just prior to installation, the backing wall shall be wire brushed and put in condition to assure proper adhesion.

EXCEPTION: Massive architectural units with approved structural supports and ties may have a thickness greater than five inches. The area of a single unit of tied veneer shall not exceed 20 square feet. The weight of tied veneer shall be supported on continuous wall ledgers, or on other approved structural supports. Tied veneer may be attached to any of the designated backings for veneer.

(b) **Weatherproofing.** Exterior tied veneer shall form a weatherproof covering.

(c) **Bedding.** All tied veneer set on footings, shelf angles, lintels, ledgers or other structural detail shall be bedded along the bearing surface in cement mortar to insure even bearing and weatherproofing. Where no bedding of cement mortar is placed on the back face of the veneer, the veneer shall be set approximately $\frac{1}{2}$ " to 1" from the backing, in which case temporary spot bedding may be used away from the ties to align the veneer. The spot bedding at the ties shall be of cement mortar entirely surrounding the ties for veneer set on the exterior of the building and plaster of Paris for spot bedding around the ties on the interior of the building.

(d) **Ledgers.** Ledgers for the support of tied veneer shall be of incombustible, corrosion-resistant material attached and bearing in a manner to support safely four times the weight of the veneer based on the yield strength of the materials.

The vertical spacing of ledgers shall not exceed 13 feet for veneer used on the exterior and interior of the building. The weight of tied veneer over all wall openings shall be carried on shelf angles or other incombustible ledgers.

A marble liner attached to the back of marble veneer units may be used for the support of the veneer on shelf angles. Each liner shall be attached to the veneer units by means of

an epoxy adhesive and $\frac{1}{4}$ -20 brass threaded rod doweling spaced at approximately 1'6" o.c. and all liners shall be set in a mortar bed on the shelf angle.

(e) Ties.

1. ➤ All veneer ties shall be of corrosion-resistant metal capable of resisting in tension or compression, a force equal to four times the weight of the attached veneer based on the yield strength of the materials. In other than concrete or masonry construction the ties shall be anchored to the wall framing.

EXCEPTION: The ties required by this subsection are not required where the veneer does not exceed four feet in height above the adjoining grade and the veneer backing per Section 91.2904(g) is provided.

If made of sheet metal, veneer ties shall be not smaller in area than one-sixteenth inch by one inch or, if made of wire, not smaller in diameter than number nine gauge wire.

Ties shall be spaced not more than 12 inches apart vertically and 24 inches apart horizontally where a design is not provided.

Every veneer tie shall be attached to a continuous horizontal tie not less in thickness than number eight gauge wire and embedded in a horizontal joint. <

2. For masonry veneer units conforming to the requirements of Division 24, and for similar masonry units approved for use as veneer, the ties shall engage by a 180 degree bend a continuous horizontal reinforcement wire of No. 8 gage laid on the center line of the veneer in the mortar of a stretcher joint.

3. For veneer units of marble, travertine, granite or other stone units of slab form, the ties shall engage drilled eyes of corrosion-resistant metal dowels located on the centerline of the edges of the units and not further apart than 24 inches around the periphery of each unit with not less than four ties per veneer unit. If not tight-fitting, the holes for dowels may be drilled not more than $\frac{1}{16}$ inch larger in diameter than the dowel, with the hole countersunk to a diameter and depth equal to twice the diameter of the pin in order to provide a tight-fitting key of cement mortar (exterior) or plaster of Paris (interior) at the pin locations when the mortar in the joint has set.

4. Tied terra cotta shall be not less than $1\frac{1}{4}$ inch in thickness with projecting dovetail webs on the back surface spaced approximately eight inches on centers. The terra cotta facing shall be tied to the backing wall with noncorrosive metal anchors not less than No. 8 gage wire installed in horizontal bed joints not less than 12 inches or more than 18 inches on centers, these anchors to be secured to $\frac{1}{4}$ -inch galvanized pencil rods which pass through the vertical aligned loop anchors in the backing wall. The veneer ties shall have sufficient strength to support the full weight of the veneer in tension. The facing shall be set with the back of the terra cotta spaced not less than two inches from the face of the backing wall, and the space shall be filled solidly with portland cement grout and pea gravel as required by Section 91.2402(s). Immediately prior to setting, the backing wall and the terra cotta facing shall be drenched with clean water and shall be distinctly damp when the grout is poured.

5. Repealed.

6. For massive architectural units structural supports and ties shall be shown in detail on the drawings submitted with the application for building permit and shall be subject to approval by the Superintendent of Building.

7. Random shaped rubble stone veneer not exceeding 10

inches in thickness laid in cement mortar and having not less than one inch of cement grout between the stone veneer and the backing wall may be used provided:

A. Anchor ties laid in masonry backing shall be galvanized wire of not less than 12-gage formed as an exposed loop which extends not less than $\frac{1}{2}$ inch beyond the face of the backing. The legs of the loop shall be not less than 6 inches in length bent at right angles, and laid in the masonry mortar joint and spaced so that the loops are 12 inches o.c. maximum in both directions. There shall be provided a 12-gage galvanized wire tie threaded through the exposed loops for every two square feet of rubble stone veneer. This tie shall have legs not less than 15 inches in length and bent so that they will lay in the stone veneer mortar joints. The last two inches of each tie leg shall have a right-angle bend.

B. Repealed.

SEC. 91.2903 — ADHESIVE VENEER

(a) Scope. The provisions of this Section shall apply to approved absorbent or vitreous veneer units of slab form with thickness not more than one inch, nor less than $\frac{1}{4}$ inch, and with the weight of the veneer not exceeding 15 pounds per square foot, such veneer units being supported by the adhesion of an approved cement or mastic applied to the veneer backing. Adherent veneer may be attached to backings of masonry, concrete, or to backing of metal lath and plaster. The strength of the adhesive cement or mastic used for attachment of adherent veneer shall be such as to resist a shearing stress of 50 pounds per square inch under test.

(b) Terra Cotta Facings. If not tied, the terra cotta facing shall be not more than one inch in thickness with units not to exceed 30 inches in any one dimension and having not more than 540 square inches of superficial area. The back face of the terra cotta shall have corrugations or vertical scorings. Immediately prior to setting the terra cotta facing, each piece shall be soaked in clean water for at least one hour and the surface of the backing wall shall be saturated with water. A brush coat of neat portland cement shall be applied to both the backing and the back side of the terra cotta facing. Mortar or grout shall be at least $\frac{3}{4}$ inch in thickness, and the mortar shall be mixed as follows:

High calcium slaked lime putty aged at least

20 days and containing not more than $\frac{1}{2}$ cu. ft.;

4% magnesium oxide clean sharp

siliceous sand 4 cu. ft.;

Ammonium stearate paste, or equal 1 qt.;

Portland cement 1 cu. ft.

(c) Absorbent Units. Slab units of tile, stone, terra cotta or other approved units of slab form with absorbent or scored contact surface may be attached by a bedding of cement mortar or grout to backings of masonry, concrete or cement plaster.

(d) Vitreous Units. 1. Glass or other vitreous veneer units may be attached to a backing of masonry, concrete or cement plaster.

2. No vitreous veneer shall be attached to any exterior wall of a height greater than 35 feet above the adjoining ground.

EXCEPTION: Units of four square inch maximum size and $3/16$ -inch maximum thickness shall not be limited in height.

3. Vitreous units less than 3/16 inch in thickness shall have an area of not more than one square foot.

Units neither more than 1/2 inch nor less than 3/16 inch in thickness shall have an area of not more than four square feet. No unit shall be larger in area than 10 square feet nor more than four feet in any face dimension.

4. Every vitreous unit shall be attached to the backing by approved mastic and approved corrosion-resistant metal ties and shall be supported upon approved corrosion-resistant metal clips.

5. The mastic shall cover not less than 1/2 of the area of the unit after the unit has been set in place and shall be neither less than 1/4 inch nor more than 1/2 inch in thickness.

The mastic shall be insoluble in water and shall not lose its adhesive qualities when dry.

Absorbent surfaces on the backing shall be sealed by a bonding coat before mastic is applied. The bonding coat shall be cohesive with the mastic.

Vitreous surfaces to which mastic is applied shall be clean and uncoated.

6. Clip angles shall be of corrosion-resistant material capable of supporting four times the weight of the supported veneer. The clip angles shall be spaced vertically in alternate horizontal joints but not more than three feet apart. The clip angles shall be spaced not farther apart horizontally than the width of the supported units.

EXCEPTIONS: 1. Below a point 22 feet above the adjacent ground elevations, the ties may be omitted.

2. Below a point six feet above the adjacent ground elevations, the ties and shelf angles may be omitted.

7. Glass veneer units shall be separated from each other and from adjoining materials by an expansion joint at least 1/32 inch in thickness. There shall be at least 1/64 inch clearance between bolts and the adjacent glass.

(e) Approved plastic material with an Average Extent of Burning, as defined in ASTM D-635-72, of not more than 1 inch may be attached to a backing of masonry, concrete or cement plaster in accordance with applicable requirements established in Division 61 and in accordance with the following:

1. No approved plastic veneer shall be attached to any exterior wall to a height greater than 35 feet above the adjoining ground;

2. Approved plastic units less than 3/16 inch in thickness shall have an area of not more than one square foot;

3. Approved plastic units neither more than 1/2 inch nor less than 3/16 inch in thickness shall have an area of not more than four square feet. No unit shall have a face dimension in excess of four feet.

4. The aggregate area of the plastic veneer shall not exceed 30 percent of the area of the wall face of the story on which it is installed;

5. Assemblies of plastic veneer shall be separated vertically by non-combustible wall surfacing to a height of at least 4 feet.

SEC. 91.2904 — VENEER BACKING

(a) **Strength.** Veneer shall not be assumed to add to the strength of the wall, column, beam, soffit or other backing in support of either vertical or lateral loading. The backing shall have sufficient strength to resist all contributed loading including that contributed by the veneer.

(b) **Sheathing.** Diagonal wood sheathing of one inch nominal thickness or other approved sheathing covered with 14-pound asphalt felt having two-inch weather lapping or equivalent weatherproofing, or approved water-repellent sheathing without felt may be used as a backing for tied veneer not exceeding a height of 25 feet above adjoining ground or floor surface. The entire weight of tied veneer shall be supported upon the wall footing and not by any portion of the backing.

Lintels over openings not exceeding five feet in width shall rest upon the veneer jambs. Lintels over openings exceeding five feet in width shall rest upon steel columns extending to the wall footing. The deflection of lintels shall not exceed $1/500$ of the span under full load of veneer. The veneer ties shall be nailed to wood sheathing with two six-penny corrosion-resistant nails for each tie. Where other than wood sheathing is used, veneer ties shall be nailed through the sheathing into the framing members.

(c) **Terra Cotta Facing.** Walls to which terra cotta facing is to be anchored shall have one-inch by six-inch horizontal grooves in the concrete to permit proper anchoring and grouting of the veneer. Grooves shall be 12 inches on vertical centers over openings and not over 30 inches elsewhere. Loop anchors of No. 8 gauge galvanized wire shall protrude from the concrete wall and shall be installed in vertical alignment approximately 12 inches on centers. They shall be spaced not less than 12 inches nor more than 18 inches on centers horizontally.

(d) **New Masonry or Concrete.** New masonry or concrete may be used as a backing for tied veneer or adherent veneer. The required system of ties shall be embedded securely in all new masonry or concrete.

(e) **Existing Masonry or Concrete.** Existing masonry or concrete may serve as a backing for tied veneer or adherent veneer. Conical holes or downward sloping cylindrical holes shall be drilled into existing masonry or concrete other than columns and beams and filled with cement mortar or grout to engage the inserted veneer ties. In event that reinforcing steel is encountered, the hole shall be relocated. In existing reinforced masonry and concrete columns and beams, holes shall not be drilled for any purpose.

EXCEPTION: *Approved calibre projectiles may be powder driven into reinforced concrete columns and beams and used for attachment of veneer ties.*

(f) **Cement Plaster.** Cement plaster reinforced in accordance with Section 91.4711(d) and attached to wood or steel framing may serve as a backing for either tied or adherent veneer. For tied veneer, the anchor ties shall be attached securely to the wood or metal framing.

(g) **Cement Mortar or Grout with Reinforcing Mesh.** Masonry veneer not exceeding five inches in thickness applied with a one-inch solid portland cement mortar or grout backing which is reinforced as required for exterior plastering with a weather resistant paper backing may be applied directly to wood stud construction provided:

1. The stud spacing does not exceed 16 inches on center;
2. The mortar reinforcement is attached at each stud by galvanized steel wire furring nails at four inches on center, said nails to have $1\frac{1}{2}$ -inch minimum penetration;
3. The bond between the masonry unit and the mortar or grout is sufficient to withstand a shearing stress of 50 pounds per square inch after curing 28 days;
4. The mortar reinforcement is attached at the top and bottom plates with eight penny common wire nails spaced eight inches on center.

DIVISION 30—GRADING, EXCAVATIONS AND FILLS

SEC. 91.3001 — GENERAL

(a) **Scope.** All grading shall be performed in accordance with the provisions of this Division and with Rules and Regulations as established by the Superintendent of Building, and shall be in accordance with the zoning, private street and division of land regulations contained in Chapter 1 of the Municipal Code, and the requirements of the approved Master Plan for the area in which the grading is to be done.

(b) **Hillside Areas.** No person shall conduct any grading operation for other than building site development in hillside areas.

EXCEPTION: Grading which is not connected with building site development may be conducted in hillside areas when the Department finds that such work enhances the physical stabilization of property, or is not detrimental to public health, safety or welfare, and is in conformity with the approved Master Plan for the area. A tentative tract or division of land map shall also not be required for such exempt grading.

(c) **Building Foundations.** A grading permit is required for any basement or retaining wall excavations exceeding 6 feet in vertical depth.

EXCEPTION: A valid building permit, issued for construction of a building or retaining wall, also authorizes necessary excavation to facilitate such construction.

Building footings and temporary shoring shall be designed and constructed as specified in Divisions 17, 28, and 48 of this Code.

(d) **Removal of Ground Cover.** The existing vegetative ground cover of any watershed in any hillside area shall not be destroyed, removed or damaged except pursuant to lawful grading, use or occupancy of the property. Removal of trees and shrubbery will be allowed where such will not disturb the turf, sod or other existing vegetative ground cover. Whenever such ground cover is removed or damaged pursuant to a grading permit, the permittee shall restore and maintain approved ground cover, or shall accomplish such other erosion control protection as is required. Such erosion control shall be completed within 30 days after cessation of the grading work where no valid building permit is in effect for this site.

(e) **Exceptions for Emergencies.** The provisions of this Code shall not apply to any grading operation which is conducted during a period of emergency or disaster, and which is directly connected with or related to relief of conditions caused by such emergency or disaster.

SEC. 91.3002 — CONDITIONS PRECEDENT TO ISSUING A GRADING PERMIT

(a) **Plans and Exploration.** 1. Plans and specifications. Plans and specifications submitted to the Department with an application for a grading permit shall include: A contour map showing the present contours of the land and the proposed contours of the land after completion of the proposed grading; a plot plan showing the location of the grading, the reports and recommendations from soils engineers or engineering geologists or both, based upon surface exploration and subsurface exploration, or both; a description of the type and features of the soil; the location of top and toe of all cuts and fills; the location of all "daylight" lines; the amount of cut and fill; the details and location of any proposed drainage structures, walls, cribbing and surface protection; the location of disposal site for excess material, if known, and the estimated dates for starting and completing grading work.

Every contour map submitted pursuant to this Subsection shall bear the name of the person responsible therefor. The Department may waive the requirement for a contour map or subsurface exploration as required by this Subsection if it finds that the information on the application is sufficient to show that the work will conform to the provisions of this Code and other relevant laws.

2. Hillside Exploratory Work. Surface and subsurface exploratory work shall be performed by a soils engineer and an engineering geologist on all hillside grading work. This exploratory work shall conform to the rules and regulations for hillside exploratory work established by the General Manager of the Department. The Department may waive this requirement when it determines from the application and site conditions that the proposed grading will conform to the provisions of the Code.

(b) **Supervision.** 1. **General.** The owner shall provide sufficient supervisory control during the grading operation to insure compliance with approved plans and with the Municipal Code. The Department may require the owner to secure the services of a soils engineer and/or an engineering geologist to implement his supervisory control.

2. Supervision on Hillside Tract Grading. All hillside tract grading shall be supervised by a registered civil engineer, soils engineer, and engineering geologist. All work shall be in conformity with the rules and regulations for the supervision of hillside tract grading established by the General Manager of the Department of Building and Safety.

RULE OF GENERAL APPLICATION #4-67 APPLIES. SEE APPENDIX LISTING.

(c) Bonds in Hillside Areas Required.

1. Surety Bond. Before a permit is issued for excavation or fill of 250 cubic yards or more of earth in a hillside area, the owner of the property shall file with the Department a bond for the benefit of the City. The bond shall be executed by the owner and a corporate surety authorized to do business in this State as a surety in an amount sufficient to cover the entire project.

EXCEPTION: Upon application by the owner, the Department may waive this requirement if it finds that the proposed grading is neither actually or potentially hazardous.

2. Cash Bond. In lieu of a surety bond, the owner may file a cash bond with the Department upon the same terms and conditions and in an amount equal to that which would be required in the surety bond. The deposit submitted in lieu of cash bond may be in the form of cash or negotiable United States Government securities.

3. Application of Bond to Adjacent Property. Where grading is required on property adjacent to the grading site under permit to complete a project satisfactorily, the owner of such adjacent property need not provide an additional grading bond if the original bond is of sufficient amount to include such additional grading.

4. Conditions of the Bond. Every bond shall be conditioned that the owner shall:

(i) Comply with all applicable provisions of this Code and all other applicable laws;

(ii) Comply with all of the terms and conditions of the grading permit to the satisfaction of the Department;

(iii) Complete all of the work described by the permit, and the plans and specifications relating thereto, within the time limit specified in the permit. Upon application by the permittee, the Department, or the Board, in case an appeal is made to it pursuant to Section 98.0403, may, for sufficient cause, extend the time specified in the permit, but no such extension shall release any surety upon the bond.

(iv) Install temporary erosion control devices when required to do so by the provisions of this Code.

5. Period and Termination of Bond. The term of each bond shall begin upon the date of filing with and shall remain in effect until the completion of the work to the satisfaction of the Department or until replaced by a new bond in the event of a change of ownership. In the event of failure to complete the work and failure to comply with all of the conditions and terms of the permit, the Department may order the work to be completed as required by the permit and to the satisfaction of the Department. The surety executing such bond, or such deposit, shall continue to be firmly bound under a continuing obligation for the payment of all necessary costs and expenses that may be incurred or expended by the City in causing any and all of such required work to be done and that said surety or the depositor assents to any lawful extension of time within which to construct and complete such work. Such costs shall include an amount equal to the cost to the City of administering the contract and supervising the work required. In the case of a cash bond, the deposit or any unused portion thereof, shall be refunded to the depositor upon completion of the work to the satisfaction of the Department. The Department may release or exonerate the bond under appropriate conditions when the public health and welfare is not jeopardized.

6. New Ownership. In the event of change of ownership during grading, the new owner may secure a new permit and post a new bond to assure completion of the grading.

7. Amount of Bond. The amount of the bond shall be based upon the number of cubic yards of material in either excavation or fill, whichever is the greater amount, and in addition shall include the cost of all drainage or other protective devices as may lawfully be required. That portion of the bond valuation covering the cost of excavation or fill shall be computed as set forth in the following table:

250 to 10,000 cubic yards.....	\$1.00 per cubic yard
10,001 to 100,000 cubic yards.....	\$10,000 plus 50 cents per cubic yard for each additional cubic yard in excess of 10,000
Over 100,000 cubic yards.....	\$55,000 plus 35 cents per cubic yard for each additional cubic yard in excess of 100,000

8. Installment Refunds. When a substantial portion of the required grading work has been completed to the satisfaction of the Department, and when the completion of the remaining grading work, site development or planting is delayed, the Department may accept the completed portion of the grading work and consent to the proportionate reduction of the bond to an amount estimated to be adequate to ensure completion of the grading work, site development or planting remaining to be performed. Only one such reduction shall be considered for each bond posted.

9. Entry Upon Premises. The Department, the Board of Public Works, the surety company, or their duly authorized representative, shall have access to the premises described in the permit for the purpose of inspecting the progress of the work.

In the event of default in the performance of any term or condition of the permit, the surety or any person employed or engaged in his behalf shall have the right to go upon the premises to complete the required work, including the installation of temporary erosion control devices.

Should the permittee or the surety fail to perform the work described by the permit and the plans and specifications relating thereto or required by any applicable law, and it is determined by either the Department or Board of Public Works that the public health, safety or general welfare is endangered by such failure, the Department, the Board of Public Works, or the representative of either, may enter upon the premises

to perform all or any part of such work, including the installation of temporary erosion control devices.

It shall be unlawful for the owner or any other person to interfere with the ingress and egress from such premises of any authorized representative or agent of any surety company or the City engaged in the work ordered by the Department or the Board of Public Works.

10. Consent of Adjacent Property Owner. Whenever any excavation or fill requires entry onto adjacent property for any reason, the permit applicant shall obtain the written consent of the adjacent property owner or his authorized representative, and shall file a copy of said consent with the Department before a permit for such grading work may be issued.

(d) Restriction of Work During Rainy Season. The period between December 1 and April 15 is hereby determined to be the period in which heavy rainfall normally occurs in the City of Los Angeles and is declared to be the "rainy season." During this period no grading work in excess of 200 cubic yards will be authorized on any single grading site under permit where the Department determines that such work will endanger the public health or safety.

Whenever it appears that any grading project previously commenced pursuant to a permit issued by the Department will not be completed prior to the commencement of the rainy season, the Department may order the installation of temporary erosion control devices to protect any property adjacent to such project. In addition, the Board of Public Works may direct the permittee to comply with the provisions of Section 61.02 of this Code.

(e) Duration of Work. No person shall conduct any grading, excavation or filling, including the export or import of earth material, between the hours of 6:00 P.M. and 7:00 A.M. on any day nor on Sunday at any time, except in emergencies as provided in Subsection (e) of Section 91.3001.

➤ **(f) Limitation of Export and Import.**

1. Export-Import Defined. As used in this Division, the term "export" and its derivatives shall be defined as the earth, brush, or similar materials transported from a grading site. The term "import" and its derivatives shall be defined as earth, brush, or similar materials transported to a grading site.

2. General Conditions. The Department shall designate routes of ingress and egress and shall impose such conditions and require such safety precautions for pedestrian and vehicular traffic as it determines are required in the interest of public health, safety, and welfare.

The imposed conditions may include but are not limited to:

a. Restrictions on the size and type of hauling equipment.
b. Requirement of traffic control devices, flagmen, and signs and markers at appropriate locations along the designated routes as provided in the City of Los Angeles Departments of Public Works and Traffic pamphlet "Work Area Traffic Control," 1971 Edition, or latest subsequent revisions.

c. Establishment of temporary "No Parking" areas authorized by the City Traffic Engineer when determined to be necessary.

d. The securing of all loads by trimming, watering or other appropriate means to prevent spillage and dust.

3. Subdivision Conditions. All conditions of import and export imposed in the approval of a tentative tract map shall be made a part of the grading permit.

4. Special Hillside Conditions. No permit requiring the import or export of more than 1000 cubic yards shall be issued for areas designated "hillside" except as hereinafter specified. A fee of \$150.00 in addition to the permit fee shall be paid for processing each application for grading under provisions of this subsection.

a. The applicant shall submit a proposed method of hauling which shall include the location of borrow and/or dispersal sites

within the "hillside" area, the portion of the haul route within the "hillside" area and extending to or from a major or secondary highway, the maximum gross weight of haul vehicles when loaded and such other information as may be requested by the Departments of Building and Safety, Traffic and Public Works. In addition, the applicant shall submit a vicinity map and list of affected property owners to be notified of the public hearing pursuant to item 4(d) of this subsection.

b. The Department shall immediately forward a copy of the hauling proposal to the Department of Public Works which shall review same to determine the effect of the proposed hauling operation on the structural integrity of the public streets, on public safety due to street alignment, width and grade, and on public health and welfare due to noise and vibration as it may affect private property situated on or adjacent to the haul route within the hillside area.

The Department of Public Works shall collect a fee and may require a bond as specified in Article 2 of Chapter VI of the Los Angeles Municipal Code. The Department of Public Works may, within 14 days after receipt of the proposal, recommend conditions to be imposed on the hauling operations to protect the public health, safety and welfare in the respects hereinabove specified.

c. The Department shall also immediately forward a copy of the hauling proposal to the Department of Traffic which shall review same to determine the effect thereof on vehicular and pedestrian traffic in the affected area. The Department of Traffic may, within 14 days after receipt of the proposal, recommend any traffic control measures deemed necessary to protect the public health, safety and welfare.

d. The Department shall, within 30 days after receipt of the proposed method of hauling, schedule a public hearing before the Board of Building and Safety Commissioners. Notice of the time, place, and purpose of said hearing shall be given by at least one publication in a newspaper of general circulation in the City, designated for that purpose by the City Clerk, not less than 10 days prior to the date of the hearing, and by the mailing of written notice not less than 10 days prior to the date of such hearing to the owners of all property within 300 feet of the site for which the grading permit has been requested as shown upon the records of the City Clerk.

e. At the public hearing, the Board of Building and Safety Commissioners shall consider the views of the applicant and all other affected persons. The Board shall then grant or conditionally grant approval of export or import operations or, in the event it determines that the grading activity including the hauling operation will endanger the public health, safety and welfare, it shall deny the request. Where conditions of the permit are recommended by the Department of Traffic or the Department of Public Works, including the condition that a bond be posted pursuant to Section 62.202 of the Los Angeles Municipal Code, such conditions shall be made a part of any permit which may be issued.

f. Any affected persons including the applicant who is dissatisfied with the decision of the Board may appeal same within five days to the City Council by filing such appeal with the City Clerk on forms which he shall provide. The City Council shall hear such appeal not later than the 10th day after the appeal has been filed. The decision of the City Council on the matter shall be final.

g. The provisions of this Subdivision shall not apply to applications for permits which apply to export or import operations which have been approved in accordance with Section 17.13 of the Los Angeles Municipal Code. <

(g) Conformance with Zoning Regulations Required.

➤ 1. No permit shall be issued for any grading or import

of earth materials to or from any grading site except in compliance with the zoning, private street and division of land regulations contained in Chapter I of the Municipal Code, the Subdivision Map Act of the State of California and the approved Master Plan for the area in which the grading is to be done.

2. No permit shall be issued for the import or export of earth materials to or from and no grading shall be conducted on any grading site in hillside areas having an area in excess of 60,000 square feet unless a tentative tract map has been approved therefor by the Advisory Agency. The Advisory Agency may waive this requirement if it determines that a tract map is not required by the division of land regulations contained in Chapter I of the Municipal Code.

EXCEPTION: The requirements of Paragraph 2 of this Subdivision shall not apply to any grading allowed under the Exception to Subsection (b) of Section 91.3001. <

(h) **Debris Prohibited.** No persons shall excavate or fill so as to cause falling rocks, soil or debris in any form to fall, slide or flow onto adjoining properties.

➤ (i) **Easements.** Before issuing any grading permit, the Department shall require a declaration, under penalty of perjury, from the applicant for a grading permit stating that:

"The proposed grading will not destroy or unreasonably interfere with any access or utility easement belonging to others and located on my property, but in the event such grading does destroy or unreasonably interfere with such easement a substitute easement(s) satisfactory to the holder(s) of the easement will be provided." <

SEC. 91.3003 — SAFETY PRECAUTIONS DURING GRADING

If at any stage of work on an excavation or fill the Department determines by inspecting that further work as authorized by an existing permit is likely to endanger any property or public way, the Department may require as a condition to allow the work to continue that plans for such work be amended to include adequate safety precautions. Safety precautions may include, but shall not be limited to, specifying a flatter exposed slope or construction of additional drainage facilities, berms, terracing, compaction, cribbing, retaining walls or buttress fills, slough walls, desilting basins, check dams, benching, wire mesh and guniting, rock fences, revetments or diversion walls.

SEC. 91.3004 — VIOLATIONS

(a) No person shall fall, refuse or neglect to comply with the following provisions:

1. All orders issued by the Department pursuant to the provisions of this Division.
2. All conditions imposed on grading permits pursuant to the provisions of this Division; and
3. All rules and regulations of the Department with respect to grading which are in effect at the time the grading permit is issued.

(b) Any person violating this subsection shall be guilty of a misdemeanor.

SEC. 91.3005 — EXCAVATIONS

(a) **Height.** No cut slope shall exceed a vertical height of 100 feet unless horizontal benches with a minimum width of 30 feet are installed at each 100 feet of vertical height.

(b) **Slope.** ➤ No excavation shall be made with a cut face steeper in slope than two horizontal to one vertical.

EXCEPTION: The Department or the Board, in case an appeal is made to it under Section 91.0304, may permit the excavation to be made with a cut face steeper in slope than two horizontal to one vertical if the applicant shows through investigation, subsurface exploration, analyses, and report by both a qualified soils engineer and an engineering geologist, to the Department's satisfaction, that the underlying bedrock

and the materials to be exposed on the slope have strength characteristics sufficient to produce a stable slope with a minimum factor of safety of not less than 1.5 for static loads.

No slopes shall be cut steeper than the bedding planes in any formation where the cut slope will lie on the dip side of the strike line. Where the excavation exposes strata above the top of the cut which will permit the entry of water along bedding planes, this area shall be sealed with a compacted soil blanket having a minimum thickness of two feet. The soil for this blanket shall be relatively impervious and shall be approved by the foundation engineer.

If the material of the slope is of such composition and character as to be unstable under the anticipated maximum moisture content, the slope angle shall be reduced to a stable value. This requirement shall be confirmed by the soils engineer's written certification following laboratory testing. <

(c) **Intervening Benches.** Intervening paved benches on cut slopes shall have a minimum width of eight feet and shall be spaced at intervals of 25 feet measured vertically.

(d) **Tops of Cut Slopes.** Tops of cut slopes shall not be made nearer to a property line than one foot, plus one-fifth the height of the cut, but need not exceed a horizontal distance of ten feet.

SEC. 91.3006 — FILLS

(a) **Height.** No fill slope shall exceed a vertical height of 100 feet unless horizontal benches with a minimum width of 30 feet are installed at each 100 feet of vertical height.

(b) **Slope.** > No fill shall be made which creates an exposed surface steeper in slope than two horizontal to one vertical. The fill slopes abutting and above public property shall be so placed that no portion of the fill lies above a plane through a public property line extending upward at a slope of two horizontal to one vertical.

EXCEPTION: The Department or the Board, in case an appeal is made to it under Section 91.0304, may permit a fill to be made which creates an exposed surface steeper in slope than two horizontal to one vertical if the applicant shows through investigation, subsurface exploration, analyses, and report by both a qualified soils engineer and an engineering geologist to the Department's satisfaction, that the fill to be used, and the underlying bedrock supporting the fill or on which the fill is to be placed have strength characteristics sufficient to produce a stable slope with a minimum factor of safety of not less than 1.5 for static loads. <

(c) **Intervening Terraces.** Intervening paved terraces on fill slopes shall have a minimum width of eight feet and shall be spaced at intervals of 25 feet measured vertically.

(d) **Compaction.** 1. All man-made fills shall be compacted to a minimum of 90 per cent relative compaction as determined by ASTM method D 1557-58T. If the required degree of compaction cannot be attained on sloped surfaces, the slope shall be cut back until the compacted inner core is exposed.

EXCEPTIONS: 1. Fills in non-hillside areas which do not exceed 18 inches in depth need not be compacted, but such fills shall not change the existing drainage pattern.

2. The Department may approve uncompacted fills in self-contained areas where the fills are not to be used to support buildings or structures and no hazard will be created.

2. Fill slopes shall be prepared for planting in one of the three following ways:

a. The slope surface of fills may be prepared for planting by casting top soil over the slope surface. The top soil layer shall not exceed three inches in depth.

b. The slope surface may be scarified to a depth not to exceed three inches.

c. Loose material not to exceed three inches in depth may be left on the slope.

.....
**EXCAVATING, DEPOSITING, DUMPING — EARTH, SAND, GRAVEL, ETC. — WHERE
 PROHIBITED (REPRINT FROM ART. 6, CHAPTER 9 OF THE LOS ANGELES
 MUNICIPAL CODE)**

Sec. 96.02. (a) No person shall, upon any private property within any residence district as described in the zoning laws of this City, dig, excavate, separate, screen or dredge for sand, gravel, earth, rock, stone, minerals, or any other substance so as to cause sand, dust or dirt to be either blown or deposited over and upon the inhabited premises of others or across or upon any public way and no person shall, in connection with any such operation, cause loud noises by the use of steam shovels, tractors, trucks or other power machinery to be made to the annoyance of occupants of adjacent or nearby habitations.

(b) No person shall upon any private property within any residence district as described in the zoning laws of this City, dump or deposit, to a level above the official grade of an abutting street, any loose earth, sand, gravel or any other similar material so as to cause or result in sand, dust or dirt being blown over and upon the inhabited premises of others, or across any public way, or so as to cause or allow such materials to be washed or eroded over and upon the premises of another or upon any public way.

(c) The foregoing prohibitions shall not apply to work necessary for the erection or alteration of a building or structure pursuant to a valid building permit issued therefor, under the provisions of Article 1 of Chapter 9 of this Code; nor to improvement work done pursuant to a plan for subdividing and improving land carried out as contemplated by Ordinance No. 79,310, nor to work done pursuant to an express permit therefor issued under Article 4 of Chapter 6 of this Code or under any other ordinance of this City. Provided, however, that no person shall claim the benefit of this exception who does not, diligently and without unnecessary or unreasonable delay, prosecute such exempted improvement work to completion in a manner calculated to avoid undue annoyance to the occupants of nearby habitations.

(d) No person shall dump, deposit, move, or place any earth, sand, gravel, rock, debris or other material, or maintain, permit or allow the same to remain in a condition so as to create the danger, possibility or probability that the same will roll, slip, slide, erode, flow or wash upon or over any public, or privately-owned property without prior written consent of the owner thereof, or upon or over any public place, highway, street, alley or way.

(e) No person shall, when hauling any earth, sand, gravel, rock, stone, debris, paper or any other substance over any public street, alley or other public place, allow such materials to blow or spill over and upon the public street, alley or other public place or adjacent private property.

(f) No person shall, when excavating, compacting, hauling or moving earth, sand, gravel, rock, stone, debris, or any other similar substance, cause, allow, or permit any mud, earth, sand, gravel, rock, stone, debris or other substance to drop, be deposited, or fall from the body, tires, or wheels of any vehicle so used upon any public street or alley without immediately and permanently removing the same therefrom.

(e) **Toes of Fill Slopes.** Toes of fill slopes shall not be made nearer to a project boundary line than one-half the height of the fill, but need not exceed a horizontal distance of 20 feet.

(f) **Inspection and Control.** Every man-made fill shall be tested for relative compaction by a soil testing agency approved by the Department. A certificate of compliance setting forth densities so determined shall be filed with the Department before approval of any fill is given.

(g) **Old Fills.** All man-made fills, whether compacted or not, which were placed prior to October 17, 1952, shall be tested for relative compaction by an approved soil testing agency before any approval to build shall be issued.

EXCEPTION: Where proposed buildings are no higher than one story high and contain an area less than 1,000 square feet, the Department may waive this requirement, provided inspection shows the fill satisfactory for the proposed use.

(h) **Combined Cut and Fill Slopes.** Where a combined cut and fill slope exceeds 25 feet in height, the required drainage bench shall be placed at the top of the cut slope. The effect of surcharge of the fill upon the cut bedrock shall be considered by the soils engineer and engineering geologist, and specific recommendations shall be made relative to the setback between the cut and fill.

(i) **Fill Areas.** Areas on which fill is to be placed shall be investigated by the soils engineer or by the soils engineer and geologist to determine it is adequate to support the fill.

EXCEPTION: The Department may waive this investigation where it determines by inspection that the underlying material is adequate to support the proposed fill.

SEC. 91.3007 — PLANTING AND IRRIGATION OF CUT AND FILL SLOPES IN HILLSIDE AREAS

(a) **General.** All fill and cut slopes in designated hillside areas which are determined by the Department to be subject to erosion shall be planted and irrigated with a sprinkler system to promote the growth of ground cover plants to protect the slopes against erosion, as required in this section.

The owner shall be responsible for planting and maintaining all slopes where such is required in this section.

(b) **Minimum Requirements.** 1. Low slopes to 15 feet in vertical height:

a. Plant with grass or ground cover plants as recommended on the planting schedule approved by the Department. Other plants recommended by a registered landscape architect will be considered for approval by the Department.

b. A sprinkler system shall be installed to irrigate these slopes as a part of the house plumbing installation.

c. The owner shall water the slopes which have been planted with grasses and/or ground cover plants at sufficient time intervals to promote growth.

EXCEPTION: Where the Department finds the slope is located in such an area as to make hand-watering possible, conveniently located hose bibs will be accepted in lieu of the required sprinkler system when a hose no longer than 50 feet would be necessary.

2. Medium slopes (15 to 38 feet in vertical height).

a. Plant with grass or ground cover plants as recommended on the planting schedule approved by the Department. Other plants may be recommended by a landscape architect for approval by the Department.

b. In addition to ground cover plants, approved shrubs having a one gallon minimum size at ten feet on center in both directions on the slope when the sprinkler system is available for irrigation may be used. The plants and planting pattern may be varied to include trees upon the recommendation of the landscape architect and approved by the Department.

c. Install an adequate sprinkler system during grading prior to planting of shrubs and trees and before grading is approved.

3. High slopes (38 feet or over in vertical height).

a. Plant with grass or ground cover plants as recommended on the planting schedule approved by the Department. Other plants recommended by landscape architects may be submitted to the Department for approval.

b. In addition to ground cover plants, approved shrubs having a minimum one-gallon size at ten feet on center in both directions on the slope, or trees at 20 feet on center both ways may be used. A combination of shrubs and trees may be utilized. This plant and planting pattern may be varied upon the recommendation of a landscape architect and approval by the Department.

c. Slopes exceeding a height where a drainage terrace is required shall be planted with shrubs, minimum size one gallon, two feet on center, parallel to the benches, and within two feet of the uphill side. Larger varieties may be staggered on each side of the bench as an alternate.

d. Install an adequately designed sprinkler system prior to planting shrubs and trees and before grading is approved.

(c) **Special Requirements for Sprinkler Systems.** 1. Plans for the sprinkler system shall be submitted to and approved by the Department prior to installation.

2. Sprinkler systems shall be designed to provide a uniform water coverage at a rate of precipitation of not less than 1/10 inch per hour nor more than 3/10 inch per hour on the planted slope. In no event shall the rate of precipitation duration of sprinkling be permitted to create a saturated condition and cause an erosion problem, or allow the discharge of excess water into any public or private street.

3. A check valve and balance cock shall be installed in the system where drainage from sprinkler heads will create an erosion problem.

4. Adequate backflow protection shall be installed in each sprinkler system as required by the Plumbing Code.

5. A functional test of the sprinkler system shall be performed by the installer for every sprinkler system prior to approval.

(d) **Plants.** All plants required by this section shall be selected from a list approved by the Department.

SEC. 91.3008 — EROSION CONTROL AND DRAINAGE DEVICES

(a) **Interceptor Terraces.** Paved interceptor terraces shall have a minimum width of eight feet and shall be installed on the face of all cut and fill slopes at intervals not to exceed 25 feet measured along a vertical plane.

The longitudinal slope of interceptor terraces shall not be less than four per cent nor more than 12 per cent and any change in rate of grade within these allowable slopes shall increase the grade in the direction of flow.

A single run of an interceptor terrace shall not exceed 150 feet to a downdrain.

Downdrains shall be embedded round pipes enclosed in concrete shape as shown in Figure E, or an alternate design which is prepared by a civil engineer and acceptable to the Department.

The cross section of interceptor terraces shall meet the specifications shown in Figure A.

(b) **Diverter Terraces.** Paved diverter terraces, constructed as shown in Figure B, shall be installed at the top of all cut slopes where the tributary drainage area above has a slope exceeding ten horizontal to one vertical and a horizontal projection of greater than 50 feet.

(c) **Berms.** Berms conforming to the provisions of Figure C shall be constructed at the top of all slopes.

(d) **Vee Channels.** Where a slough wall is required at the toe of the slope by other provisions of this ordinance, a Vee Channel shall be constructed behind the wall to carry off the slope waters.

(e) **Inlet Structures, Downdrains and Outlet Structures.**

1. **Inlet Structures.** Inlet structures shall be of concrete, galvanized iron hot-dipped in asphalt or equivalent. The inlet shall be grated or grided, or of such entry shape as to prevent entry of objects of greater than four inches in dimension. Inlet structures shall be placed on the bench as shown in Detail G and shall be so shaped as to provide small entry losses. An overflow structure into the "Vee" downdrains shall be provided.

2. **Downdrains.** Downdrains shall have paved inverts and shall be of concrete, minimum 18-gage corrugated galvanized, asbestos bonded iron (or hot-dipped in asphalt), or corrugated alloy 3004-H34 aluminum of minimum 18-gage and hot-dipped in asphalt or equivalent. Pipe downdrains shall conform with Figure E and shall have a diameter of a size required by run-off calculations, but no less than 12 inches.

Open channel downdrains shall be designed by a civil engineer and shall have a minimum capacity equal to four times the required pipe size. The alignment of downdrains shall be such as to conserve velocity head.

3. **Outlet Structures.** Outlet structures shall be of concrete, galvanized iron hot-dipped in asphalt or equivalent.

Where outletting into streets, the structure shall be of a design approved by the Department of Public Works. Where outletting into natural watercourses or other approved locations, the structure shall be provided with adequate velocity reducers, diversion walls, rip-rap, concrete aprons or any similar energy dissipator. All slope drainage shall be collected and disposed of in the drainage device.

(f) **Run-off Computations.** Run-off shall be based upon the proper 50 year isohyetal, and the run-off calculation shall be based upon the latest methods adopted by the Bureau of Engineering.

(g) **Drainage Dispersal Wall.** A drainage dispersal wall shall be constructed as set forth in Figure F whenever it is necessary to convert channel flow to sheet flow.

(h) **Subdrains.** Subdrains shall be laid under all fills placed in natural watercourses. Subdrains shall be placed along the watercourse flow line and along the flow line of any branches tributary thereto. Additional subdrains shall be installed to collect any active or potential springs or seeps which will be covered by the fill. Subdrains shall be installed after the watercourse has been excavated to firm material in preparation for receiving the fill. Individual design shall be shown on each plan for City approval, based on the recommendations of the soils engineer and geologist to the satisfaction of the Department.

(i) **Gutters.** Eave or ground gutters shall be provided to receive all roof water and deliver it through a non-erosive device to a street or watercourse if the slope of the underlying natural ground exceeds 3 per cent or if more than 3 feet of compacted fill or more than one foot of uncompacted fill is placed on the ground.

(j) **Site Drainage.** All building pads with cut or fill shall slope a minimum of two per cent to an approved drainage device or to a public street. Where used, the drainage device shall be an adequately designed system of catch basins and drain lines which conducts the water to a street.

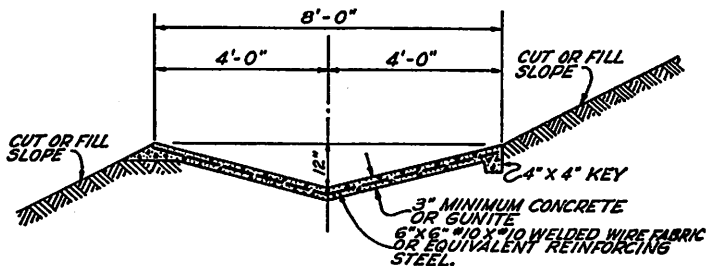
EXCEPTION: Where the slope of the underlying natural ground does not exceed three percent and the compacted fill is less than three feet in depth, the slope of the pad may be reduced to one percent.

(k) **Drainage Around Building.** On graded hillside sites, acceptable drainage devices shall be installed to conduct storm water around buildings wherever the distance from the building to the top of any slope is less than five feet.

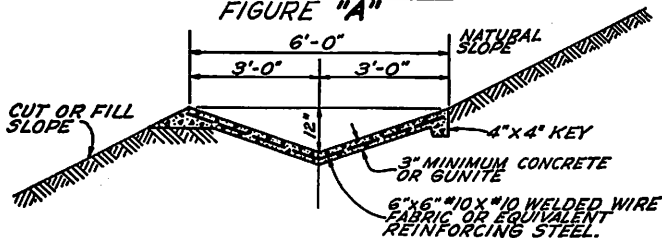
(l) **Maintenance of Drainage.** Drainage in conformance with the provisions of this Code shall be maintained during and subsequent to construction.

DRAINAGE DEVICES

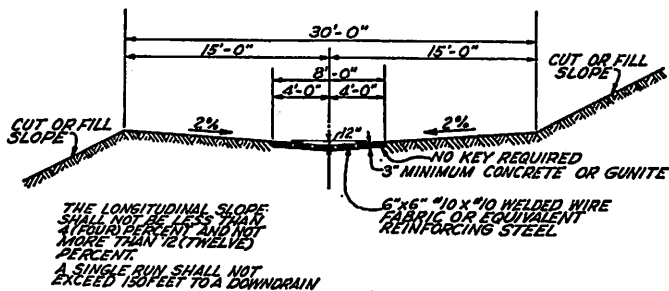
SEC. 91.3008



INTERCEPTOR TERRACE
FIGURE "A"



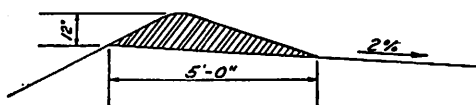
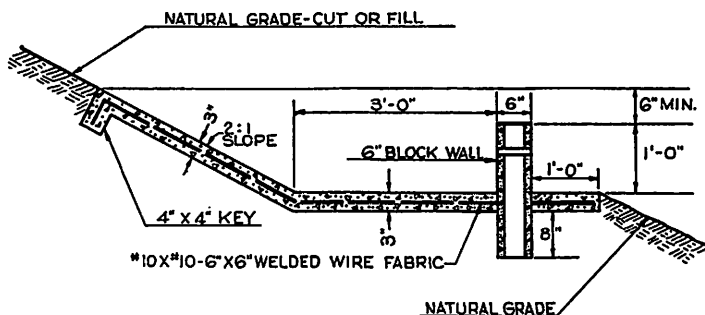
DIVERTER TERRACE
FOR TOP OF CUT SLOPES
FIGURE "B"



**DEPARTMENTAL STANDARD FOR INTERCEPTOR
TERRACE AND 30 FOOT HORIZONTAL BENCH**

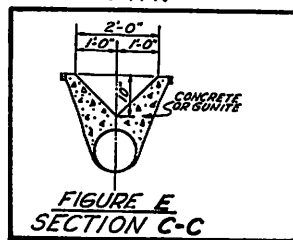
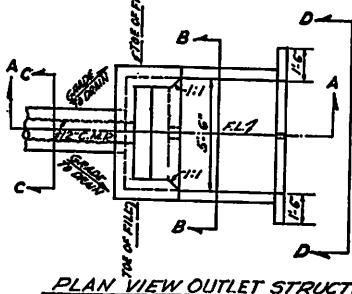
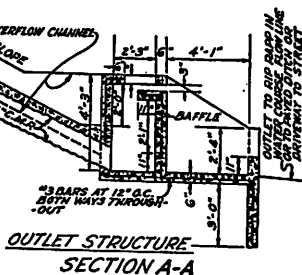
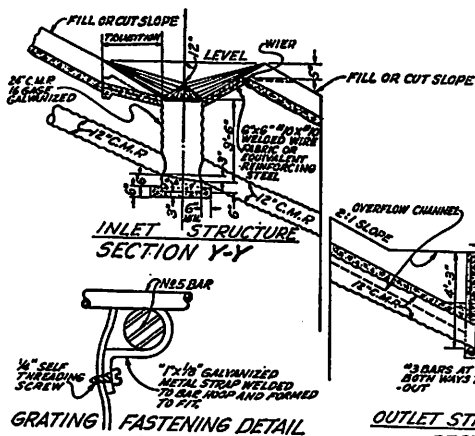
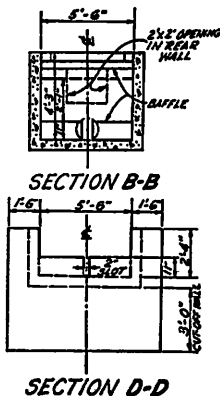
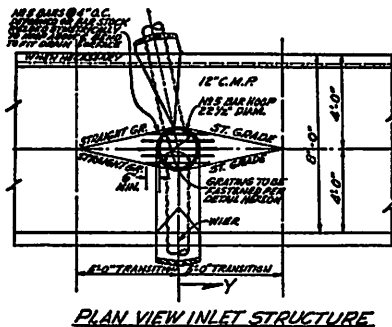
NOTES:

1. Concrete drainage benches shall be formed before pouring concrete. Forms shall be set to grade and alignment at all breaks in the cross-sections. The concrete shall be screeded to cross-sections.
2. Gunite drainage benches shall be shot to wire guides. Guides shall be set to grade and alignment at all breaks in the cross-section. The Gunite shall be screeded to cross-section.
3. When concrete is to be placed against earth, the area to be covered shall be trimmed and finished to the dimensions shown on the plans. The area shall be moistened and thoroughly compacted to form a firm foundation. Grade stakes shall be installed to clearly establish flow lines.

DRAINAGE DEVICES**SEC. 91.3008****FIGURE "C"****BERM DETAIL****FIGURE "F"****DRAINAGE DISPERSAL WALL**

1. Grout all cells and omit all head joints first course.
2. Wall to be located along contour line to establish uniform overflow or seepage.
3. Length of wall to equal length of contour line affected by grading.
4. When concrete is to be placed against earth, the area to be covered shall be trimmed and finished to the dimensions shown on the plans. The area shall be moistened and thoroughly compacted to form a firm foundation. Grade stakes shall be installed to clearly establish flow lines.

DRAINAGE DEVICES

SEC. 91.8008

INLET AND OUTLET STRUCTURES DETAIL "G"

SEC. 91.3009 — CONSTRUCTION REQUIREMENTS AND LIMITATIONS

(a) **Construction, General.** No structure shall be constructed upon a slope steeper than two horizontal to one vertical.

EXCEPTIONS: 1. Subject to approval by the Department, construction may be placed upon slopes steeper than 2:1, provided reports from a soils engineer and engineering geologist recommend favorably, toward construction. The reports shall incorporate provisions for downhill creep in the design of footings where applicable. A fee as indicated in Section 91.0212 shall be charged for processing the reports.

2. Where a minor amount of the structure is constructed on the slope or where the construction consists of an unroofed deck or low retaining structure, the Department may approve the construction without engineering and geological reports.

(b) **Clearance.** Building shall be located clear of the toe of all slopes which exceed a slope of two horizontal to one vertical according to the provisions of this Subsection. The clearance shall be one-half of the vertical height of the slope with a minimum clearance of three feet and a maximum clearance of 15 feet. Where the existing slope exceeds one horizontal to one vertical the required clearance shall be measured from a line where an imaginary 45 degree plane projected down from the top of the slope intersects the building pad. Where a retaining wall is constructed at the toe of the slope, the height of the slope shall be measured from the top of the wall to the top of the slope.

EXCEPTION: 1. Second-story cantilever projections may extend a maximum of four feet into the required clearance. Where a retaining wall is constructed at the toe of the slope the required clearance from the allowable projection shall be determined from a slope height measured from the base of the wall to the top of the slope.

2. Attached one-story carports, patios, porches and other similar construction which is open and unobstructed on the side facing the slope except for necessary structural members, may project into the required clearance but in no event shall the clearance be reduced to less than three feet.

3. For detached accessory buildings not used for living purposes the required clearance may be reduced to three feet.

(c) **Building Construction on Compacted Filled Ground. 1. General.** No building shall be located within a horizontal distance of 40 feet from the top of an inclined fill slope exceeding 100 feet in vertical height measured from the toe to the top of the fill unless said building is designed to withstand the resulting total and differential settlements. The foundation engineer shall submit evidence of the anticipated settlement behavior.

2. Measure of Settlement. Prior to permitting building on high fills, the Superintendent of Building may require the determination of the settlement characteristics of such fills to establish that any movements have substantially ceased. In such cases, a system of benchmarks shall be installed at critical points on the fill and accurate measurements of both horizontal and vertical movements shall be taken for a period of time sufficient to define the settlement behavior. In no case shall the period of time be less than one year, with at least four consecutive checks made at intervals of three months.

(d) **Footing Elevations.** On graded hillside sites the top of footing stem or finish floor, if a concrete slab, shall extend above the elevation of the low point of the street curb a minimum of six inches, plus two per cent of the distance from the footing to the curb.

Where the site drains to an approved drainage device, the footings shall extend above the elevation of the low point of the

device a minimum of six inches, plus two per cent of the distance from the footing to the device.

(e) **Slough Wall.** If potential sloughing hazards affecting buildings or structures are present on cut or fill slopes in excess of 20 feet in vertical height, where such slopes parallel said buildings or structures slough protection devices may be required by the Department.

SEC. 91.3010 — BUTTRESS FILLS

(a) **General.** A buttress fill is a designed compacted earth fill used for providing lateral support to an unstabilized rock mass. All buttress fills shall comply with the requirements of this section.

(b) **Foundation.** The ability of the foundation soil to support the buttress shall be investigated and additional benching required to what is otherwise specified for ordinary fills. The foundation engineer shall provide specifications for keying of the base of the buttress and for bonding the buttress to the natural ground.

(c) **Base Width.** The minimum base width of a buttress fill shall not be less than 12 feet nor less than one-half its height, whichever is the greater. The width of a buttress fill may vary uniformly to a top width of not less than 12 feet.

(d) **Slope.** ➤ The exposed surface of a buttress fill shall not exceed a slope of two horizontal to one vertical.

EXCEPTION: The Department or the Board, in case an appeal is made to it under Section 91.0304, may permit a buttress fill to be made which creates an exposed surface steeper in slope than two horizontal to one vertical if the applicant shows through investigation, subsurface exploration, analyses, and report by both a qualified soils engineer and an engineering geologist to the Department's satisfaction, that the buttress fill to be used and the underlying bedrock supporting the fill or on which the fill is to be placed will have strength characteristics sufficient to produce a stable slope with a minimum factor of safety of not less than 1.5 for static loads. ◀

(e) **Subdrain.** Subdrains which blanket the entire back face of the buttress or which occur at intervals shall be provided to prevent build-up of hydrostatic pressure. Details of subdrains shall be provided by the foundation engineer.

(f) **Blanket Seals.** Blanket seals of relatively impervious material shall be required on cut pads above buttress fills where grading exposes the strata to infiltration of water. The blanket shall be of two foot minimum thickness or of such greater dimension as specified by the foundation engineer.

(g) **Height.** The maximum height of a buttress fill shall be limited to 30 feet unless the foundation engineer provides substantiating calculations to justify a height above 30 feet.

For design purposes, a maximum value of 75 p.s.f. cohesion and an angle of internal friction of six degrees may be used to determine the resistance of the bedding plane. Use of greater values shall be substantiated by tests taken along the probable slip plane under conditions simulating the worst possible field conditions. The method of performing these tests shall be included in the foundation engineer's report.

The mass of earth to be retained shall be assumed to extend a minimum distance from the top face edge of the buttress equal to: (a) the vertical height of the buttress when the surface slope above does not exceed six degrees, or (b) 100 feet when surface slope above the buttress exceeds six degrees.

The type, per cent compaction, cohesion and angle of internal

friction of the materials to be placed in the buttress shall be specified.

The buttress fill shall be designed for a minimum safety factor of 1.50 based upon the smaller value of yield or ultimate shear strength of the fill material.

(h) **Deviations.** ➤ Upon justification by the foundation engineer, deviations from the above requirements [other than those set forth in Subsection (d)] may be approved by the Department or by the Board in case an appeal is made to it pursuant to Section 98.0403 of the Los Angeles Municipal Code. ◀

SEC. 91.3011 — AREAS SUBJECTED TO SLIDES AND UNSTABLE SOIL

(a) **General.** The provisions of this section shall be fully complied with prior to issuance of a grading permit in areas subject to slides or unstable soil.

(b) **Records and Maps.** The Department may adopt maps delineating areas of relative hazard for the application of this Division.

(c) **Definitions.** The following definitions shall apply for the purpose of this section:

Landslide. The falling, slipping or flowing of a mass of land from a higher to a lower level.

Active Landslide. Landslide that has been active since January 1, 1952.

Historic Landslide. Landslide that was active in historic time prior to 1952 as determined from photographs, maps and written records.

Prehistoric Landslide. Conditions where there is no record of historic landslide but where geological evidence or topographic expression indicate modification of the terrain by land movement.

Possible Prehistoric Landslide. Areas where there is no record of a historic landslide but where topographic expression or geological evidence suggest the possibility of past land movement.

(d) **Permission to Construct Buildings or to do Grading Work.**
1. **Active Landslide and Historic Landslide Areas.** No building or grading permits shall be issued for construction in active or historic landslide areas until, and unless, stabilization on the entire slide of soil mass on which the property lies can be satisfactorily demonstrated to the Department.

2. **Prehistoric Landslide or Questionable Areas.** No building or grading permit shall be issued for construction in prehistoric landslide or questionable areas except by specific approval of the Department, based upon statements from approved foundation engineers and engineering geologists, attesting to the apparent safety of the proposed developments. For these areas, the affidavit required in Division 2 of of this Code shall be filed unless it has been determined that, as a result of satisfactory reports by approved foundation engineers and engineering geologists, the property is not in an area subject to slides or unstable soil. A fee as indicated in Section 91.0212 shall be charged for processing the reports.

3. **Other Areas.** If, in the opinion of the Superintendent of Building or his authorized agent, there is evidence of potential hazards in areas other than those indicated, the Superintendent of Building may require satisfactory reports from approved foundation engineers and engineering geologists, and after reviewing such reports, may issue a permit when the reports testify to the apparent safety of the development. The affidavit may be required by the Department if it is found that the area in question has elements of hazard or, if the reports so indicate, a permit may be refused. A fee as indicated in Section 91.0212 shall be charged for processing the reports.

(e) **Affidavits Required.** When an affidavit required in this section has been filed, upon notice of correction of the unstable conditions due to landslide or unstable soil, the Superintendent of Building shall file with the Office of the County Recorder a certificate specifying that the property is no longer considered hazardous due to landslide or unstable soil.

SEC. 91.3012 — FOOTINGS ON APPROVED COMPACTED FILLS

(a) **General.** Dwelling foundations located partially or wholly upon compacted filled ground shall meet the following minimum requirements:

1. Exterior and interior bearing wall footings shall be continuous and shall be reinforced with a minimum of one #4 bar top and bottom.

2. Interior floor and nonbearing wall supports may be pier footings not less than 16 inches x 16 inches in plan view unless unusual soil conditions require the use of continuous footings reinforced as in Subdivision 1 of this subsection.

3. Provisions shall be made to preserve the continuity of beam action in the footing wall at underfloor access openings.

EXCEPTION: The requirement for reinforcing steel called for above may be eliminated only after a definite recommendation of the foundation engineer in a written report which is acceptable to the Department. This exception applies only to controlled compacted fills of uniform thickness.

(b) **Expansive Soils.** Dwelling footings located upon expansive type soil or on farmland where soil is loose to a depth of 12 inches or more, or on lands which were formerly orchards, groves or swampy areas, or other unsatisfactory soil conditions, shall be continuously reinforced with one #4 bar top and bottom of all exterior and interior bearing wall footings.

SEC. 91.3013 — DEFINITIONS

For the purposes of this Division, certain terms shall be defined as follows:

Civil Engineer: Civil engineer shall mean a civil engineer duly licensed by the State of California who makes tract layouts for hillside subdivisions and furnishes the necessary controls to achieve the proper angle of cut and fill slopes, the necessary drainage provisions, street and curb grades, storm drain design and other matters related to the geometric finish of said tracts.

Engineering Geologist: Engineering geologist shall mean a certified engineering geologist duly licensed by the State of California who applies the geological sciences to engineering practice for the purpose of assuring that the geological features affecting the location, design, construction, operation and maintenance of engineering works are recognized and adequately provided.

Soils Engineer: Soils engineer shall mean a civil engineer duly licensed by the State of California who is experienced in soil mechanics and slope stability analysis and is approved by the Department. His primary duties shall encompass the investigation of proposed grading sites and tracts as related to the stability of the finished graded product. He shall be especially interested in the presence of ground water as it may affect stability and of the angle of cut or fill slopes from a stability standpoint.

DIVISION 31 — WOOD PRESERVATIVES

SEC. 91.3101 — GENERAL

(a) **Definitions.** For the purpose of this Division certain terms are defined as follows:

Treated Wood. Wood treated with a preservative in conformity with American Wood Preservers Association Standards C1, C2, C3, C4, C9, C23 and C28, except that the final retention shall be not less than the amounts exhibited in Table No. 31-A or 31-B.

Wood Preservative. Any preservative conforming to the provisions of Section 91.3104.

Durable Wood. Untreated wood conforming to the provisions of Section 91.3105.

(b) **Marking.** Every member required to be of treated wood or of durable wood shall bear an approved mark applied by an approved testing agency. The testing agency shall certify that lumber or plywood bearing its identification mark conforms to the requirements of this Division.

**TABLE NO. 31-A — PRESERVATIVE TREATMENT
FOR LUMBER**

Preservative	Minimum Retention — Lbs./Cu. Ft. (By Assay)	
	In Direct Contact with Ground	Not in Contact with Ground
Creosote	10 ⁽¹⁾	8
Creosote-Coal Tar Solution	10 ⁽¹⁾	8
Creosote-Petroleum Solution	10 ⁽¹⁾	8
Pentachlorophenol	0.5	.40
Acid copper chromate	Not Permitted	.25
Ammoniacal copper arsenite	0.40	.23
Chromated copper arsenate	0.40	.23
Chromated Zinc chloride	Not Permitted	.46
Fluorchrome arsenate phenol	Not Permitted	.22

NOTE: ⁽¹⁾ May be reduced by two pounds per cubic foot for any member having a least dimension greater than five inches.

SEC. 91.3102 — REQUIREMENTS

(a) **Lumber.** The grade shall be established and the lumber shall be grade-marked as specified in Division 25 of this Article.

Surfaced lumber may be used wherever a minimum nominal size is specified in this Code.

(b) **Wood in Contact with Ground.** All wood embedded in the ground or in direct contact with the ground and used for the support of permanent structures shall be treated wood.

(c) **Wood in Contact with Masonry or Concrete.** In addition to the requirements of Subsection (a) of this Section, all wood in direct contact with masonry or concrete shall be treated wood or durable wood.

EXCEPTIONS: 1. If 48 inches or more from the nearest ground, wood in contact with masonry or concrete need not be treated or durable wood.

2. Exterior siding or sheathing may be painted on the back with two coats of any preservative acceptable for use in treated wood.

**TABLE NO. 31-B — PRESERVATIVE TREATMENT
FOR POLES SUPPORTING BUILDINGS**

Preservative	Minimum Retention — Lbs./Cu. Ft. (By Assay)			
	Species			
	Douglas Fir	Western Larch	Ponderosa Pine	Lodgepole Pine
Creosote	12	16	9	16
Pentachlorophenol	0.60	0.80	0.45	0.80
Ammoniacal Copper Arsenite	0.60	0.60	0.60	0.60
Chromated Copper Arsenate	0.60	0.60	0.60	0.60

SEC. 91.3103 — FIELD TREATMENT

Cut or damaged surfaces of treated wood shall be painted with two coats of any preservative acceptable for use in treated wood.

SEC. 91.3104 — WOOD PRESERVATIVES

Wood preservatives used for the treatment of wood and the amounts of preservatives retained in the wood after treatment shall be as set forth in Tables No. 31-A and 31-B.

SEC. 91.3105 — DURABLE WOOD

(a) General. The intent of this Section is to define certain durable woods containing toxic constituents in amounts sufficient to inhibit the growth of fungi or termites.

(b) Redwood. Redwood, used as durable wood, shall conform to the specifications for "Foundation Grade" set forth in "Standard Specifications for Grades of California Redwood Lumber" adopted by the California Redwood Association.

(c) Cedar. Western Cedar, used as durable wood, shall conform to the specifications for "Foundation Lumber", set forth in Supplement X (d) of the "Standard Grading and Dressing Rules", No. 15, established by the West Coast Lumber Inspection Bureau and modified in Subsection (d) below.

(d) Toxic Constituents. In addition to the other requirements of this Section, all durable wood shall contain not less than 12% weight of natural extractives which are soluble in hot water. The amount of extractive shall be determined in a specimen on the basis of the oven-dry weight of the wood before extraction.

SEC. 91.3106 — APPROVAL OF EQUIVALENT METHODS

The Department may approve any other method of wood treatment if it finds that such treatment is equal in effectiveness and permanence to any method allowed by this Code. No method of treatment shall be approved unless supported by proof that wood so treated will withstand attack by fungi or termites in an environment where the same wood, untreated, will be attacked by fungi or termites.

SEC. 91.3107 — TESTS

(a) Tests Required. Whenever the Superintendent of Building finds evidence that any wood required to be durable wood or treated wood does not conform to the requirements of this Division, he may order such wood to be tested to determine the amount of toxicants or preservatives contained therein.

If the wood under consideration fails to pass the tests, it shall be replaced with wood conforming to the requirements of this Division.

All testing and replacement shall be done without expense to the City.

SEC. 91.3108 — USE OF TREATED WOOD FOR BUILDING FOOTINGS

Treated wood may be used in footing systems where approved by the Superintendent of Building, provided such footing systems, under the proposed conditions of use, are demonstrated to be equivalent to the durability and safety of other systems permitted by the Code.

DIVISION 32 — ROOF CONSTRUCTION AND COVERING

SEC. 91.3201 — ATTIC SPACES

(a) Access. An attic access opening shall be provided in the ceiling of the top floor of buildings with combustible ceiling or roof construction. The opening shall be located in a corridor or hallway of buildings of three or more stories in height, and readily accessible in buildings of any height. The opening shall be not less than 22" x 30".

Thirty inch minimum clear headroom shall be provided above all access openings. Attics with a maximum vertical clear height of less than 30 inches need not be provided with access openings.

All attic access openings shall have a cover.

In other than R-1 Occupancies the cover shall:

1. Be of materials permitted by Section 91.3201(b) for attic separations.

2. Hinge to hang down when opened.

3. Have a catch securing it in the closed position.

(b) Attic Spaces. Attic spaces formed by combustible materials shall be partitioned into horizontal areas not exceeding 2,500 square feet. This area may be tripled to 7,500 square feet if attic space is sprinklered throughout. Partitions shall be one-hour fire-resistive, or shall be solid partitions of corrugated iron not thinner than No. 24 gage, or of plaster board or plywood not less than ½ inch in thickness, or of tight matched wood one inch in nominal thickness. All plaster board, or metal partitions shall be nailed at not to exceed four inches on center with six penny nails at each support. Supports shall be two inches nominal thickness material spaced not over 24 inches on center. Openings in the partitions shall be protected with self-closing doors constructed as required for the partition.

Attic spaces of combustible material shall have a ventilating area of not less than one square inch for each 10 square feet of attic area. One-half of required ventilators shall be placed at or near the crown of the ridge of the roof.

SEC. 91.3202 — ROOF COVERINGS

(a) General. The roof covering of every building shall be a fire retardant roof covering.

EXCEPTIONS: 1. Outside of all Fire Districts and Fire Buffer Zones, wood shingles or shakes may be used for the roof covering of any wood frame building if permitted by Table No. 17-A and if not required elsewhere in this Code to be fire-retardant.

2. The requirements of this Section shall not apply to storage sheds and accessory buildings not used for human occupancy and outside of all Fire Districts and Fire Buffer Zones, if not more than 1,000 square feet in area.

3. Corrugated sheets of approved plastic may be used as transparent or translucent roofing material where roofs are not required to be fire retardant.

Corrugated sheets of approved plastic material as provided in Division 61 with an average extent of burning, as defined in ASTM D-635-72, of not more than one inch, may be used as transparent or translucent roofing material where roofs are required to be fire retardant subject to the following provisions:

pg 119

(1) *The balance of the roof covering is non-inflammable corrugated roofing, the area of each such section does not exceed 100 square feet and each section of such plastic is separated from every other such section of plastic by at least eight feet in every direction. The total aggregate area of such section shall not exceed 80% of the total area of the roof;*

4. Fire retardant plastic screening or wood lath may be used as the roof of a lathhouse in Fire District 2. Where wood lath is used, it shall be regulation $\frac{3}{8}$ inch material spaced so that a minimum of 40% of the roof is open.

RULE OF GENERAL APPLICATION #4-69 APPLIES. SEE APPENDIX LISTING.

(b) **Definitions.** For the purpose of this Division certain terms are defined as follows:

Bonded. The application of a heated asphalt bonding agent in an amount not less than 20 pounds per 100 square feet, or a cold liquid asphalt cement in an amount not less than $1\frac{1}{2}$ gallons per 100 square feet.

Cap Sheet. Roofing felt made of organic or asbestos fibers, saturated and coated both sides with a bituminous compound and surfaced with mineral granules, smooth surfaced with mica, talc or similar mineral, or surfaced with asbestos fibers, except unexposed portions of split cap sheets.

Felt. Roofing felt made of organic, asbestos or glass fibers and saturated with a bituminous compound.

Fire Retardant Roof Covering. Any roof covering specified in this Division or conforming to the specifications of the Underwriters' Laboratory for either Class "A", "B" or "C" roof covering as published in the Underwriters' Laboratory "Building Materials List".

Flat Roof. A roof whose slope is not more than three inches measured vertically to 12 inches measured horizontally.

Pitched Roof. A roof whose slope is greater than three inches measured vertically to 12 inches measured horizontally.

Pound. The manufacturers shipping weight in pounds of 100 square feet of actual roof coverage.

Spot Bonded. Intermittent application of a bituminous bonding agent at the rate of not less than seven pounds per 100 square feet at points of roof area not more than 18 inches apart in any direction.

Strip Bonded. Applications of bituminous bonding agent applied in parallel strips not more than 12 inches apart center to center at the rate of not less than seven pounds per 100 square feet.

Underlay. One or more layers of felt over which is placed a cap sheet, or asbestos shingles, or composition shingles.

(c) **Materials.** Mineral surfaced cap sheets and asphalt shingles shall conform to United States Government Federal Specification No. SS-R-521.

Smooth surfaced cap sheets shall conform to United States Government Federal Specification No. E-SS-R-501.

Hot asphalt shall conform to Federal Specification No. SS-A-666 for roofing asphalt. Cold asphalt liquid cement shall be delivered in original sealed containers.

Felt of organic or asbestos fibers shall conform to Federal Specification No. HH-F-191 Type I and Type II. Felt of glass fibers shall conform to Federal Specification No. SS-R-00620 Type I and Type II.

Nails shall be not smaller than No. 12 gauge, with heads not less than $\frac{3}{8}$ inch in diameter and shall be long enough to penetrate into the sheathing $\frac{3}{4}$ inch or through the thickness of the sheathing, whichever is less. Exposed nails shall be corrosion-resistant.

(d) **Application.** Underlays shall be attached to the roof deck by one of the following methods:

1. Nailing at points not more than 12 inches apart in any direction to one inch nominal sheathing, $\frac{1}{2}$ inch minimum thickness plywood or approved nailable insulated decking;

2. Strip or spot bonding to an existing composition roof or any roof deck except square edged sheathing boards.

In those areas designated by the Board as subject to high wind velocity, the underlay shall be a 30 pound minimum weight felt and shall be attached to the roof deck with one inch minimum diameter headed nails or nails driven through tin caps.

Asphalt shingles shall be nailed with four nails or with two nails and two spot bondings for strip shingles not more than 36 inches wide and with two nails for individual shingles not more than 12 inches wide.

Heated bitumen shall be applied at a temperature not more than 450 degrees Fahrenheit. The temperature test shall be made in the second container, drawn consecutively, either at the kettle valve or at the end of the pump line on the roof.

Bituminous bonding agents shall not be allowed to remain at a temperature in the kettle higher than 450 degrees Fahrenheit when the kettle is not being drawn from for a period of one hour or more.

(e) **Composition Roofs and Walking Decks.** Every composition roof covering shall consist of two or more layers of 45-pound smooth surfaced cap sheet or of an underlay bonded to a cap sheet. The total weight of underlay and cap sheet shall be not less than 80 pounds. The underlay shall consist of two or more layers of 14-pound or heavier felt bonded together.

EXCEPTIONS: 1. 8-pound glass fiber felt may be substituted for 14-pound organic or asbestos felt, provided each layer is bonded with at least 30 pounds of hot mopped roofing asphalt per 100 square feet of roof area.

2. On arched or pitched roofs, the underlay may be one layer of 30-pound felt, or 40-pound coated base sheet.

(f) **Gravel Surfaced Roofs.** Every gravel surfaced roof shall consist of three or more layers 14-pound or heavier felt bonded together and surfaced with not less than 40 pounds of bituminous bonding agent and not less than 250 pounds per 100 square feet of surfacing material (pea gravel, slag, crushed rock, or similar inert material) applied while the bonding agent is still adhesive. The surfacing material shall not exceed $\frac{5}{8}$ inch and be well graded in size. The layers of felt shall be secured to the roof structure as specified for "underlay" except that all nail heads shall be covered by one layer of felt.

(g) **Split Cap Sheets.** Every roof covering of split cap sheets shall consist of two layers of cap sheets bonded together and lapped at least 19 inches on pitched roofs and on flat roofs shall be laid over and bonded to an underlay of at least one layer of 14-pound felt.

(h) **Asphalt Shingles.** The weight of asphalt shingles when laid shall not be less than 200 pounds. On roofs having a slope of less than seven inches to 12 inches, asphalt shingles shall be laid over an underlay of 14-pound or heavier felt unless triple thickness is provided at all points.

EXCEPTION: *Outside of Fire Districts the weight of asphalt shingles when laid may be not less than 168 pounds.*

Asphalt shingles shall not be installed on a roof having a slope less than three inches to 12 inches.

(i) **Asbestos Felt Roof Coverings.** Asbestos felt roof coverings shall consist of an asbestos cap sheet bonded to an underlay composed of two or more layers of 14-pound or heavier felt bonded together, or of two or more layers of 14-pound or heavier asbestos felt bonded together and bonded to an underlay of one layer of 30-pound felt.

(j) **Re-roofing.** When a composition roof or an asbestos felt roof is applied over an existing composition flat roof, the underlay may be one layer of 14-pound or heavier felt. No underlay shall be required for split cap sheet roofing. In re-roofing gravel roofs, the existing gravel shall be removed and the underlay may be one layer of 30-pound felt, 40-pound base sheet or two layers of 14-pound or heavier felt mopped together.

Pitched roofs of all types may be re-roofed by nailing a cap sheet 18 inches or more in width over the existing roof, lapping seams two inches and nailing or spot bonding every four inches. Asbestos shingles, or composition shingles weighing 130 pounds or more may be used without underlay to re-roof pitched roofs if nailed as provided in Subsection (d).

Any metal roof may be covered by a cap sheet bonded in place.

(k) **Tile.** Every tile roof shall have two layers of 14-pound asphalt-saturated felt underlay or one layer of 30-pound asphalt-saturated felt underlay. The layers of felt shall be mopped between and on top with asphalt weighing not less than 20 pounds per 100 square feet.

All types of roof tile including shingle type, flat or interlocking, shall be fastened in place with corrosion resistant nails or wire not smaller than No. 14 gauge, or by other approved device. All nails shall penetrate the sheathing at least $\frac{3}{4}$ inch. The connection device shall be capable of resisting a force equal to four times the weight of the tile applied in any direction.

Interlocking roof tile having anchor lugs on bottom of tile shall be held in position by means of a one-inch by two-inch stripping nailed to the roof sheathing over the underlay and nailed or fastened in place as required for all types of roof tile.

No roof tile shall absorb, during immersion in water for a period of 48 hours, an amount of water weighing in excess of 15% of the weight of the dry tile.

EXCEPTION: *Flat tile on roofs whose slope is less than one vertical to 12 horizontal may be cemented in place with mortar or mastic.*

(l) **Metal Roofs.** Corrosion-resistant iron or nonferrous metals used for roof covering shall be not less in thickness than No. 26 gauge unless supported by a structural membrane.

(m) **Corrugated Asbestos Cement Roofing.** Corrugated asbestos cement roofing not less than 5/16 inch thick may be used wherever No. 24 gage corrugated iron is permitted.

(n) **Insulation.** Combustible roof insulation not more than two inches in thickness may be used on all types of construction except unsprinklered Type IV buildings. On unsprinklered Type IV buildings, combustible insulation not more than two inches in thickness may be used over the deck, provided no highly combustible vapor seal or adhesive such as asphalt, pitch or tar is used between the insulation and the deck. All combustible roof insulation shall be covered with an approved roof covering.

(c) **Asbestos Shingles.** Asbestos shingles shall conform to the specifications of the Underwriters' Laboratories for either Class "A" or Class "B" roof coverings as published in "List of Fire Protection Equipment and Materials".

SEC. 91.3203 — ROOF DRAINAGE

(a) **General.** Roof systems not designed to support accumulated water shall have a positive slope or camber equivalent to ¼-inch per foot of horizontal distance between the drain and the high point of the roof for drainage, in addition to camber required for dead load deflection due to initial set and long time deformation. See Section 91.2301(1).

(b) **Roof Drains.** Unless roofs are sloped to drain over roof edges or are designed to support accumulated water, roof drains shall be installed at each low point of the roof.

Roof drains shall be adequate in size to convey the water to the approved discharge location.

(c) **Overflow Drains and Scuppers.** Where roof drains are required, overflow drains having the same size as the roof drains shall be installed with the inlet flow line located two inches above the low point of the roof; or overflow scuppers having three times the size of the roof drains and having a minimum opening height of four inches may be installed in adjacent parapet walls with the inlet flow line located two inches above the low point of the adjacent roof.

Overflow drains shall be connected to drain lines independent from the roof drain lines.

EXCEPTION: In engineered roof drainage systems the roof drain line and overflow drain line may be combined below the roof.

(d) **Concealed Piping.** Roof drains and overflow drains, when concealed within the construction of the building, shall be installed as required for plumbing vents by the Los Angeles Municipal Code.

(e) **Drainage Over Sidewalks.** No roof drain discharging roof drainage shall be located within 25 feet of a public way if the drainage water flows over the public sidewalk.

EXCEPTION: Groups R and J Occupancies are exempt from the requirements of this Subsection.

DIVISION 33 — STAIRS, EXITS AND OCCUPANT LOADS

SEC. 91.3301 — GENERAL

(a) **Purpose.** The purpose of this Division is to determine occupant loads and to provide minimum standards of egress facilities for occupants of buildings, reviewing stands, bleachers, and grandstands.

(b) **Scope.** Every building or portion thereof shall be provided with exits as required by this Division. Where there is a conflict between a general requirement and a specific requirement for an individual occupancy, the specific requirement shall be applicable.

(c) **Definitions.** For the purpose of this Division certain terms are defined as follows:

Balcony, Exterior Exit. A landing or porch projecting from the wall of a building, and which serves as a required means of egress. The long side shall be at least 50 percent open, and the open area above the guardrail shall be so distributed as to prevent the accumulation of smoke or toxic gases.

Exit Passageway. An enclosed means of egress connecting a required exit or exit court with a public way.

Exterior Stairway. Any stairway having at least one of the longer sides entirely open, or openings of equivalent area distributed about its periphery. Necessary railings and structural supports may occur in the openings. It may have a roof above the uppermost landing.

Horizontal Exit. A way of passage from one building into another building on approximately the same level, or is a way of passage through or around a wall constructed as required for a two-hour occupancy separation and which completely divides a floor into two or more separate areas so as to establish an area of refuge affording safety from fire or smoke coming from the area from which escape is made.

Occupant Load. The total number of persons that may occupy a building or portion thereof at any one time.

Private Stairway. A stairway serving one tenant only.

(d) **Determination of Occupant Load.** The occupant load permitted in any building or portion thereof shall be determined by dividing the floor area assigned to that use by the square feet per occupant as set forth in Table No. 33-A.

When the square feet per occupant is not given for a particular occupancy it shall be determined by the Department, based on the area given for the occupancy which it most nearly resembles.

EXCEPTIONS: 1. The occupant load of an area having fixed seats shall be determined by the number of fixed seats installed. Aisles serving the fixed seats and not used for any other purpose shall not be assumed as adding to the occupant load.

2. The occupant load permitted in a building or portion thereof may be increased above that specified in this Section if the necessary exits are provided. An aisle or seating diagram shall be required and shall be approved by and filed with the Los Angeles Fire Department and shall be posted in the building or room to substantiate an increase in occupant load.

In determining the occupant load, all portions of a building shall be presumed to be occupied at the same time.

EXCEPTION: Accessory use areas which ordinarily are used only by persons who occupy the main areas of an occupancy shall be provided with exits as though they were completely occupied, but their occupant load need not be included in computing the total number of occupants for the building.

(e) **Overcrowding.** The number of occupants of any building or portion thereof shall not exceed the permitted or posted capacity.

(f) **Benches, Pews, Booths.** Where benches or pews are used, the number of seats shall be based on one person for each 18 inches of length of the pews or benches. Where booths are used in dining areas, the number of seats shall be based on one person for each 24 inches or major portion thereof of length of booth.

(g) **Mixed Occupancies.** The capacity of a building containing mixed occupancies shall be determined by adding the number of occupants of the various portions as set forth in Table No. 33-A.

(h) **More Than One Purpose.** For determining exit requirements the capacity of a building or portion thereof which is used for different purposes, shall be determined by the occupant load which gives the largest number of persons.

(i) **Exit Obstruction.** No obstructions shall be placed in the required width of an exit except projections permitted by this Division.

(j) **Posting of Room Capacity.** Any room having an occupant load of more than 50 where fixed seats are not installed, and which is used for classroom, assembly, or similar purpose, shall have the capacity of the room posted in a conspicuous place near the main exit from the room. Approved signs shall be maintained in a legible manner by the owner or his authorized agent, and shall indicate the number of occupants permitted for each room use.

(k) **Changes in Elevation.** Within a building, changes in elevation of less than 12 inches along any exit serving a tributary occupant load of 10 or more shall be by ramps.

EXCEPTION: Group R Occupancies and along aisles adjoining seating areas.

(l) **Fire Escape Doors.** Doors may be installed in exit ways leading to existing fire escapes if the doors are marked with exit lights and signs as specified in Section 91.3312 and if the doors contain glass panels whose area is 25 percent of the door area. The door shall be openable without the use of a key on the side leading to the fire escape.

(m) **Building Line.** No door shall open over a building line.

(n) **Reviewing Stands, Grandstands and Bleachers.** For special provisions applicable to reviewing stands, grandstands, and bleachers, see Section 91.3321.

SEC. 91.3302 — EXITS REQUIRED

(a) **Number of Exits.** Every building or usable portion thereof shall have at least one exit, and shall have not less than two exits where required by Table No. 33-A.

In all occupancies, floors above the first story having an occupant load of more than 10 shall have not less than two exits.

➤ **EXCEPTION:** Except as provided in Table No. 33-A, only one exit shall be required from a second floor area within a dwelling unit. See Section 91.1402(d) for emergency exits from sleeping rooms. ◀

Each mezzanine used for other than storage purposes, if greater in area than 2000 square feet or if more than 60 feet in

any dimension, shall have not less than two stairways to an adjacent floor.

For special requirements for Groups A, B, S, D, and E Occupancies, and open parking garages, see Sections 91.3315, 91.0704, 91.0804, 91.3318, 91.1040 and 91.1104. For stage exits, see Section 91.3903.

Every story or portion thereof, having an occupant load of 500 to 999 shall have not less than three exits.

Every story or portion thereof, having an occupant load of 1000 or more, shall have not less than four exits.

The number of exits required from any story of a building shall be determined by using the occupant load of that story, plus the percentages of the occupant loads of floors which exit through the level under consideration as follows:

1. Fifty percent of the occupant load in the first adjacent story above (and the first adjacent story below, when a story below exits through the level under consideration).

2. Twenty-five percent of the occupant load in the story immediately beyond the first adjacent story.

The maximum number of exits required for any story shall be maintained until egress is provided from the structure.

For purposes of this Section, basements or cellars and occupied roofs shall be provided with exits as required for stories. Floors above the second story, basements and cellars used for other than service of the building shall have not less than two exits.

EXCEPTION: Except as provided in Table No. 33-A, only one exit shall be required for a basement or cellar within a single dwelling unit. See Section 91.1402(d) for emergency exits from sleeping rooms.

(b) **Width.** The total width of exits in feet shall be not less than the total occupant load served divided by 50. Such width of exits shall be divided approximately equally among the separate exits. The total exit width required from any story of a building shall be determined by using the occupant load of that story, plus the percentages of the occupant loads of floors which exit through the level under consideration as follows:

1. Fifty percent of the occupant load in the first adjacent story above and the first adjacent story below, when a story below exits through the level under consideration.

2. Twenty-five percent of the occupant load in the story immediately beyond the first adjacent story.

The maximum exit width required from any story of a building shall be maintained.

(c) **Arrangement of Exits.** If only two exits are required they shall be placed a distance apart equal to not less than one-half of the length of the maximum over-all diagonal dimension of the building or area to be served, measured in a straight line between exits.

EXCEPTION: Where exit enclosures are provided as the required means of egress and are interconnected by a corridor conforming to the requirements of Section 91.3304(g) exit separations may be measured in a direct line of travel within the exit corridor. Enclosure walls shall be not less than 30 feet apart at any point in a direct line of measurement.

Where two or more exits are required, they shall be arranged a reasonable distance apart so that if any one becomes unusable the other or others will be available.

(d) **Distance to Exits.** The maximum distance of travel from any point to an exterior exit door, horizontal exit, exit passage-

way or an enclosed stairway in a building not equipped with an automatic fire-extinguishing system throughout, shall not exceed 150 feet or 200 feet in a building equipped with an automatic fire-extinguishing system throughout. These distances may be increased 100 feet when the last 150 feet is within a corridor, complying with Section 91.3304.

(e) **Exits Through Adjoining or Accessory Areas.** Exits from a room may open into an adjoining or intervening room or area provided such adjoining room is accessory to the area served and provides a direct means of egress to an exit corridor, exit stairway, exterior exit, horizontal exit, exterior exit balcony or exit passageway.

EXCEPTION: Exits are not to pass through kitchens, store rooms, rest rooms, closets or spaces used for similar purposes.

Foyers, lobbies and reception rooms constructed as required for corridors shall not be construed as intervening rooms.

TABLE NO. 33-A — AVAILABLE SQUARE FEET PER OCCUPANT AND EGRESS FACILITIES

Use	Minimum of Two Exits Other Than Elevators Are Required Where Number of Occupants Is Over ^a	Square Feet Per Occupant	Egress by Means of a Ramp or an Elevator Must be Provided for the Physically Handicapped as Indicated ^b
Aircraft Hangers (No repair)	10	500	Yes
Auction Rooms	30	7	Yes
Assembly Areas, Concentrated Use (without fixed seats)	50	7	Yes ^{3,4}
Auditoriums			
Bowling			
Alleys (Assembly areas)			
Churches and Chapels			
Dance Floors			
Lodge Rooms			
Reviewing Stands			
Stadiums			
Assembly Areas, Less- concentrated use	50	15	Yes ³
Conference Rooms			
Dining Rooms			
Drinking Establish- ments			
Exhibit Rooms			
Gymnasiums			
Lounges			
Skating Rinks			
Stages			

Children's Homes and Homes for the Aged	5	80	Yes ⁵
Classrooms	50	20	Yes
Dormitories	10	50	Yes ⁵
Dwellings	10	300	No
Garage, Parking	30	200	Yes ^c
Hospitals and Sanitariums — Nursing Homes	5	80	Yes ¹
Hotels and Apartments	10	200	Yes in Hotels and in Apart- ments of more than 3 stories
Kitchen-Commercial	30	200	No
Library Reading Rooms	50	50	Yes ³
Locker Rooms	30	50	Yes
Malls	50	50	Yes
Mechanical Equipment	30	300	No
Nurseries for Children (Day-care)	5	35	Yes
Offices	30	100	Yes ⁵
School Shops and Vocational Rooms	50	50	Yes
Stores — Retail Sales Rooms	See		
Basement	Footnote 7	20	Yes
Ground Floor	50	30	Yes
Upper Floors	10	50	Yes
Warehouses	30	300	Yes ^c
All Others	50	100	

(1) Refer to Section 91.3318 for other specific requirements.

(2) Elevators shall not be construed as providing a required exit.

(3) Access to secondary areas on balconies or mezzanines may be by stairs only.

(4) Reviewing stands, grandstands and bleachers need not comply.

(5) Access to floors other than closest to grade may be by stairs only.

(6) Access to floors other than that closest to grade and to garages used in connection with apartment houses may be by stairs only.

(7) See Section 91.3302 for basement exit requirements.

(8) Refer to Chapter 7 of Division 5 of Title 1 of the Government Code commencing with Section 4450 for other requirements for the physically handicapped.

SEC. 91.3303 — DOORS

(a) General. This Section shall apply to every exit door serving an area having an occupant load of more than 10, or serving hazardous rooms or areas. Buildings or structures used for human occupancy shall have at least one exit door which meets the requirements of Subsection (d). Subsections (h) and (i) shall apply to all doors, regardless of occupant load.

(b) **Swing.** Exit doors shall swing in the direction of exit travel when serving any hazardous area or when serving an occupant load of 50 or more.

Double acting doors shall not be used as exits serving a tributary occupant load of more than 100; nor shall they be used as a part of a fire assembly, nor equipped with panic hardware. A double acting door shall be provided with a view panel of not less than 200 square inches.

(c) **Type of Lock or Latch.** Exit doors shall be openable from the inside without the use of a key or any special knowledge or effort.

***EXCEPTION:** This requirement shall not apply to exterior exit doors in a Group F (other than repair garages) or G Occupancy if there is a readily visible, durable sign on or adjacent to the door stating "THIS DOOR TO REMAIN UNLOCKED DURING BUSINESS HOURS". The sign shall be in letters not less than 1 inch high on a contrasting background. The locking device must be of a type that will be readily distinguishable as locked. The use of this Exception may be revoked by the Department for due cause.*

Manually operated edge or surface mounted flush bolts and surface bolts are prohibited. When exit doors are used in pairs and approved automatic flush bolts are used, the door leaf having the automatic flush bolts shall have no door knob or surface mounted hardware. The unlatching of any leaf shall not require more than one operation.

(d) **Width and Height.** Every required exit doorway shall be of a size as to permit the installation of a door not less than 3 feet in width and not less than 6 feet 8 inches in height. When installed in exit doorways, exit doors shall be capable of opening at least 90 degrees and shall be so mounted that the clear width of the exitway is not less than 28 inches. In computing the exit width required by Subsection 91.3302(b), the net dimension of the exitway shall be used.

(e) **Door Leaf Width.** No leaf of an exit door shall exceed 4 feet in width.

(f) **Special Doors.** Revolving, sliding and overhead doors shall not be used as required exits. Approved power operated doors may be used for exit purposes.

***EXCEPTION:** Notwithstanding other provisions of this Code, security grills or doors shall be permitted as exits from G Occupancies adjacent to malls, provided:*

A. All areas have a conforming means of egress other than such security grills or doors.

B. All security grills or doors are provided with a key locking device so as to enable the grills or doors to be locked in the open position, and are so locked, during business hours.

C. A readily visible sign is placed adjacent to such security grills or doors stating, "This grill (or door) to remain locked in the open position during business hours".

(g) **Egress from Door.** Every exit door required by this Section shall give immediate access to an approved means of egress from the building.

(h) **Change in Floor Level at Doors.** Regardless of the occupant load, there shall be a floor or landing on each side of a door. The floor or landing shall be not more than 1 inch lower than the threshold of the doorway. Where doors open over landings, the landing shall have a length of not less than 5 feet.

EXCEPTIONS: 1. Where the door opens into the stair tower of a smokeproof enclosure, the landing need not have a length of 5 feet.

2. In Group R Occupancies and within individual units of Group H Occupancies, a door may open on the top step of a flight of stairs or on an exterior landing, provided the door does not swing over the top step or exterior landing and the landing is not more than 7½ inches below the floor level.

(i) **Door Identification.** Glass doors shall conform to the requirements specified in Section 91.1711.

Other exit doors shall be so marked that they are readily distinguishable from the adjacent construction.

(j) **Additional Doors.** When additional doors are provided for egress purposes, they shall conform to all provisions of this Division.

EXCEPTION: Approved revolving doors having leaves which collapse under opposing pressure may be used in exit situations, provided:

1. Such doors have a minimum width of 6 feet 6 inches.
2. They are not used in occupancies where exits are required to be equipped with panic hardware.
3. At least one conforming exit door is located adjacent to each revolving door installed in a building.
4. The revolving door shall not be considered to provide any exit width.

SEC. 91.3304 — CORRIDORS AND EXTERIOR EXIT BALCONIES

(a) **General.** This Section shall apply to every corridor serving as a required exit for an occupant load of 10 or more persons. For the purpose of this Section the term "corridor" shall include "exterior exit balcony" and any covered or enclosed exit passageway including walkways, tunnels and malls.

Foyers, lobbies and reception rooms meeting the construction requirements of corridors as specified in this Section may be classed as corridors.

Partitions, rails, counters and similar space dividers not over 5 feet in height above the floor shall not be construed to form corridors.

(b) **Width.** Every corridor shall be not less in width than 44 inches. For special requirements for Groups S and D Occupancies, see Sections 91.0804 and 91.3318.

(c) **Height.** Corridors and exterior exit balconies shall have a clear height of not less than 7 feet measured to the lowest projection from the ceiling.

(d) **Projections.** The required width of corridors shall be unobstructed.

EXCEPTION: Trim, handrails, and doors when fully opened, shall not reduce the required width by more than 7 inches. Doors in any position shall not reduce the required width by more than one-half.

(e) **Access to Exits.** When more than one exit is required, they shall be so arranged that it is possible to go in either direction from any point in a corridor to a separate exit, except for dead ends permitted by this Section. When a corridor or exterior exit balcony is accessible to an elevator, changes in elevation of the floor shall be made by means of a ramp.

(f) **Dead Ends.** Corridors with dead ends are permitted when the dead end does not exceed 20 feet in length.

(g) **Construction.** Walls of corridors serving an occupant load of 30 or more shall be of not less than one-hour fire-resistive construction and the ceilings shall be not less than that required for a one-hour fire-resistive floor or roof system.

EXCEPTIONS: 1. One-story buildings housing Group G Occupancies need not comply with the requirements of this Subsection.

2. This Subsection shall not apply to corridors more than 30 feet in width in fully sprinklered buildings housing Group G Occupancies, provided the areas served by such corridors have at least one exit independent from the corridor.

3. Approved plastic diffusers that are an integral part of a recessed lighting fixture listed by an approved laboratory may occupy up to 30 percent of the ceiling area.

4. Exterior sides of exterior exit balconies need not comply with the requirements of this Subsection.

When the ceiling of the entire story is an element of a one-hour fire-resistive floor or roof system, the corridor wall may terminate at the ceiling. When the room side fire-resistive membrane of the corridor wall is carried through to the underside of a fire-resistive floor or roof above, the corridor side of the ceiling may be protected by the use of ceiling materials as required for one-hour floor or roof system construction or the corridor ceiling may be of the same construction as the corridor walls.

Ceilings of noncombustible construction may be suspended below the fire-resistive ceiling.

(h) **Openings.** Where corridor walls are required to be of one-hour fire resistive construction by Subsection (g) above, every door opening shall be protected by a tight-fitting smoke barrier and fire assembly having a fire protection rating of not less than 20 minutes when tested in accordance with ASTM E152 "Standard Method of Fire Tests of Door Assemblies" without the hose stream test. Doors shall be maintained self-closing as described in < Section 91.4307(b).

Glazed openings of the size and construction permitted for three-fourths-hour fire door assemblies in Section 91.4307(c)3 may be installed in such doors. Other interior openings shall be protected by approved ¼-inch thick wired glass set in steel frames. The total area of all openings, other than doors, in any portion of an interior corridor shall not exceed 25 percent of the area of the corridor wall of the room which it is separating from the corridor. > Duct openings in fire-resistive corridor walls and ceilings shall be protected by approved fire dampers tested in accordance with the provisions of Section 91.4307(d). <

EXCEPTION: Protection of openings in the interior walls of exterior exit balconies is not required.

(i) **Location on Property.** Exterior exit balconies shall not be located in an area where openings are required to be protected due to location on the property.

SEC. 91.3305 — STAIRWAYS

(a) **General.** Every stairway serving any building or portion thereof shall conform to the requirements of this Section.

EXCEPTION: Stairs or ladders used only to attend equipment are exempt from the requirements of this Section.

(b) **Width.** Stairways serving an occupant load of more than 50 shall be not less in width than 44 inches. Stairways serving an occupant load of 50 or less may be 36 inches wide. Private

stairways serving an occupant load of less than 10 may be 30 inches wide.

Trim shall not reduce the required width by more than 3½ inches. Handrails may project from each side of a stairway a distance of 3½ inches into the required width.

(c) **Rise and Run.** The rise of every step in a stairway shall not exceed 7½ inches and the run shall be not less than 10 inches. Maximum variations in height of risers and in the width of treads in any one flight shall be ¼-inch.

EXCEPTION: Private stairways serving an occupant load of less than 10 and stairways to unoccupied roofs may be constructed with an 8-inch maximum rise and 9-inch minimum run.

(d) **Winding Stairways.** In Group R Occupancies and in private stairways in Group H Occupancies, winders may be used if the required width of run is provided at a point not more than 12 inches from the side of the stairway where the treads are the narrower, but in no case shall any width of run be less than 6 inches at any point.

(e) **Circular Stairways.** Circular stairs may be used as an exit, provided the minimum width of run is not less than 10 inches and the smaller radius is not less than twice the width of the stairway. Maximum variations in height of risers and in the width of treads in any one flight shall be ¼-inch.

(f) **Landings.** Every landing shall have a dimension measured in direction of travel equal to the width of the stairway. Such dimension need not exceed 4 feet when the stair has a straight run. Landings when provided, shall not be reduced in width by more than 3½ inches by a door when fully open. A landing shall be provided at each end of every flight of stairs. See Section 91.3303(h).

EXCEPTIONS: 1. Stairs serving an unoccupied roof are exempt from these provisions.

2. Landing widths may be reduced at corners, provided the width of exit travel is maintained clear of all obstructions and that any change in landing width is accomplished by a smooth transition.

3. The requirements of this Subsection shall not apply to Group R Occupancies.

(g) **Basement Stairways.** Where a basement stairway and stairway to an upper story terminate in the same exit enclosure, an approved barrier shall be provided to prevent persons from continuing on into the basement. Directional exit signs shall be provided as specified in Section 91.3312(b).

➤ EXCEPTION: Such barriers and exit signs in stairways in Group R Occupancies and stairways within individual apartments in Group H Occupancies shall not be required. ◀

(h) **Distance Between Landings.** There shall be not more than 12 feet vertically between landings.

(i) **Handrails.** Stairways shall have handrails on each side, and every stairway required to be more than 88 inches in width shall be provided with not less than one intermediate handrail for each 88 inches of required width. Intermediate handrails shall be spaced approximately equal within the entire width of the stairway.

Handrails shall be placed not less than 30 inches nor more than 34 inches above the nosing of treads. They shall be continuous the full length of the stairs and except for private stairways at least one handrail shall extend not less than 6 inches beyond the top and bottom risers and ends shall be returned or shall terminate in newel posts or safety terminals.

EXCEPTIONS: 1. Stairways 44 inches or less in width and stairways serving one individual dwelling unit in Group H or R Occupancies may have one handrail, except that such

stairways open on one or both sides shall have handrails provided on the open side or sides.

2. Stairways having less than four risers need not have handrails.

Handrails projecting from a wall shall have a space of not less than 1½ inches between the wall and the handrail.

All unreinforced glazing adjacent to stairways or stairway landings, the lower edge of which glazing is less than 42 inches above the landing or 30 inches from the tread nosing, shall be separated from stairways by handrails and from landings by guardrails.

(j) **Guardrails.** See Section 91.4404.

(k) **Exterior Stairway Protection.** All openings in the exterior wall below or within 10 feet, measured horizontally, of an exterior exit stairway serving a building over two stories in height shall be protected by a self-closing fire assembly having a three-fourths-hour fire-resistive rating.

EXCEPTION: Openings may be unprotected when two separated exterior stairways serve an exterior exit balcony.

(l) **Stairway Construction—Interior.** Interior stairways shall be constructed as required by Table No. 17-A of Division 17 of this Article.

Where there is enclosed usable space under stairs the walls and soffits of the enclosed space shall be protected on the enclosed side as required for one-hour fire-resistive construction. See Section 91.3308.

All required interior stairways which extend to the top floor in any building three or more stories in height shall have provided at the highest point of the stair shaft an approved hatch openable to the exterior not less than 16 square feet in area with a minimum dimension of two feet.

EXCEPTION: ➤ 1. The hatch shall not be required on smokeproof enclosures or on stairways that extend to the roof with an opening onto that roof.

2. The hatch shall not be required on stairways in Group R Occupancies and on stairways within individual apartments in Group H Occupancies. ◀

Adequate signs lettered with figures not less than two inches high indicating the floor level shall be provided in interior stairways at each floor in buildings three or more stories in height.

➤ EXCEPTION: Such signs shall not be required in stairways in Group R Occupancies and in stairways within individual apartments in Group H Occupancies. ◀

(m) **Stairway Construction — Exterior.** Exterior stairways shall be of noncombustible material except that on Type III buildings not exceeding two stories in height, and on Type V buildings, they may be of wood not less than 2 inches in nominal thickness.

Exterior stairways shall not project into yards where protection of openings is required.

Where there is enclosed usable space under stairs, the walls and soffits of the enclosed space shall be protected on the enclosed side as required for one-hour fire-resistive construction.

(n) **Stairway to Roof.** In every building three or more stories in height, one stairway shall extend to the roof surface, unless the roof has a slope greater than four in 12.

➤ EXCEPTION: Stairways in Group R Occupancies and stairways within individual apartments in Group H Occupancies shall not be required to extend to the roof surface. ◀

(o) **Headroom.** Every required stairway shall have a headroom clearance of not less than 6 feet 6 inches. Such clearances shall be established by measuring vertically from a plane parallel and tangent to the stairway tread nosing to the soffit above at all points.

SEC. 91.3306 — RAMPS

(a) **General.** Ramps used as exits shall conform to the provisions of this Section.

(b) **Width.** The width of ramps shall be as required for stairways.

(c) **Slope.** Ramps required by Table No. 33-A shall not exceed a slope of one vertical to 10 horizontal. The slope of other ramps shall not exceed one vertical to 8 horizontal.

(d) **Landings.** Ramps having slopes greater than one vertical to 15 horizontal shall have landings at the top and bottom and at least one intermediate landing shall be provided for each 5 feet of rise. Top landings and intermediate landings shall have a dimension measured in the direction of ramp run of not less than 5 feet. Landings at the bottom of ramps shall have a dimension in the direction of ramp run of not less than 6 feet.

Doors in any position shall not reduce the minimum dimension of the landing to less than 42 inches and shall not reduce the required width by more than 3½ inches when fully open.

(e) **Handrails.** Ramps having slopes exceeding one vertical to 15 horizontal shall have handrails as required for stairways except that intermediate handrails shall not be required.

(f) **Construction.** Ramps shall be constructed as required for stairways.

(g) **Surface.** The surface of ramps shall be roughened or shall be of nonslip materials.

(h) **Special Guardrails.** All unreinforced glazing adjacent to a ramp or ramp landing, the lower edge of which glazing is less than 42 inches above the ramp or ramp landing, shall be protected by guardrails.

SEC. 91.3307. — HORIZONTAL EXITS

(a) **Used as a Required Exit.** If conforming to the provisions of this Division a horizontal exit may be considered as a required exit.

(b) **Openings.** All openings in a wall which provide a horizontal exit shall be protected by a fire assembly having a fire-resistance rating of not less than one and one-half hours. Such fire assembly shall be maintained self-closing ➤ ➤ as provided in Section 91.4307(b).

(c) **Discharge Areas.** A horizontal exit shall lead into a floor area having capacity for an occupant load not less than the occupant load served by such exit. The capacity shall be determined by allowing 3 square feet of net clear floor area per ambulatory occupant and 20 square feet per nonambulatory occupant. The area into which the horizontal exit leads shall be provided with exits other than additional horizontal exits as required by Section 91.3302.

SEC. 91.3308 — EXIT ENCLOSURES

(a) **General.** Every interior stairway, ramp, or escalator shall be enclosed as specified in Division 17 of this Article.

➤ **EXCEPTION:** *Stairs in Group R Occupancies and stairs within individual apartments in Group H Occupancies need not be enclosed.* ➤

(b) **Enclosure Construction.** Enclosure walls, partitions and ceilings shall be of the same materials and fire-resistive construction as required for "shaft enclosures" for the type of building involved.

(c) **Openings into Enclosures.** There shall be no openings into exit enclosures except exit doorways and openings in exterior walls. All exit doors in an exit enclosure shall be pro-

tected by a fire assembly having a fire-protection rating of not less than one hour where one-hour shaft construction is permitted and one and one-half hours where two-hour shaft construction is required. Doors shall be maintained self-closing or shall be automatic closing by means of products of combustion detectors other than heat as provided for in Section 91.4307(b). The maximum transmitted temperature end point shall not exceed 450°F. above ambient at the end of 30 minutes of the fire exposure specified in A.S.T.M. E152 "Fire Test for Door Assemblies".

In buildings more than five stories in height, every stairway enclosure shall be provided with exit doors which are openable to the interior of the building and are separated by not more than four intervening stories. These doors shall be openable from inside the stairway enclosure without the use of a key or special knowledge and shall be identified by a sign bearing the words "ALTERNATE EMERGENCY ESCAPE". Security alarm system may be used on these doors.

(d) **Extent of Enclosure.** Stairway and ramp enclosures shall include landings and parts of floors connecting stairway flights and shall also include a corridor on the ground floor leading from the stairway to the exterior of the building. Enclosed corridors or passageways are not required from unenclosed stairways. Every opening into the corridor shall comply with the requirements of Subsection 91.3308(c).

EXCEPTION: In office buildings classed as a G-1 Occupancy, a maximum of 50 percent of the exits may discharge through a street floor lobby, provided the required exit width is free and unobstructed and the entire street floor is protected with an automatic fire-sprinkler system.

(e) **Barrier.** A stairway in an exit enclosure shall not continue below the grade level exit unless a barrier is provided at the ground floor level to prevent persons from accidentally continuing into the basement. The barrier shall be constructed of materials permitted for shaft construction and shall provide an effective draft and smoke barrier in addition to preventing accidental travel into levels below grade.

(f) **Use of Space Under Stair.** There shall be no enclosed usable space, under stairways in an exit enclosure, nor shall the open space under such stairways be used for any purpose.

SEC. 91.3309 — SMOKEPROOF ENCLOSURES

(a) **General.** A smokeproof enclosure shall consist of a vestibule and continuous stairway enclosed from the highest point to the lowest point by walls of two-hour fire-resistive construction. The supporting frame shall be protected as set forth in Table No. 17-A.

(b) **When Provided.** When a smokeproof enclosure is provided it shall be used to meet the requirements of Subsection (n) of Section 91.3305.

(c) **Construction.** Stairs in smokeproof enclosures shall be of noncombustible construction.

(d) **Outlet.** A smokeproof enclosure shall exit into a public way or into an exit passageway leading to a public way. The exit passageway shall be without other openings and shall have walls, floors, and ceilings of two-hour fire resistance.

(e) **Barrier.** A stairway in a smokeproof enclosure shall not continue below the grade level unless an approved barrier is provided at the ground level to prevent persons from accidentally continuing into the basement.

(f) **Access.** Access to the stairway shall be by way of a vestibule or by way of an open exterior balcony of noncombustible materials.

(g) **Smokeproof Enclosures by Natural Ventilation. 1. Doors.** Doors to both the vestibule and to the stairway shall have a one-hour fire-resistive rating and have closing devices as specified in Subdivision 6 of Subsection 91.3309(h).

2. Open Air Vestibule. The vestibule shall have a minimum of 16 square feet of opening, in a wall facing an exterior court, yard or public way at least 20 feet in width.

(h) **Smokeproof Enclosures by Mechanical Ventilation. 1. Doors.** The door from the building into the vestibule shall have a one and one-half hour fire-resistive rating and have closing devices as specified in Subsection (b) of Section 91.4307.

The door from the vestibule to the stairway shall be a tight-fitting door equal to not less than an exterior type solid wood door without voids, assembled with exterior type glue, 1½-inch minimum thickness set in a steel frame. Wired glass, if provided, shall not exceed 100 square inches in area and shall be set in a steel frame. The door shall be provided with a drop sill or other provision to minimize air leakage.

2. Vestibule Size. The vestibule shall have a minimum dimension of 44 inches in width and 72 inches in direction of exit travel.

3. Vestibule Ventilation. The vestibule shall be provided with not less than one air change per minute and the exhaust shall be 150 percent of the supply. Supply air shall enter and exhaust air shall discharge from the vestibule through separate, tightly constructed ducts used only for that purpose. Supply air shall enter the vestibule within 6 inches of the floor level. The top of the exhaust register shall be located at the top of the smoke trap but not more than 8 inches down from the top of the trap and shall be entirely within the smoke trap area. Doors, when in the open position, shall not obstruct duct openings. Duct openings may be provided with controlling dampers, if needed, to meet the design requirements but are not otherwise required.

NOTE: For buildings where such air changes would result in excessively large duct and blower requirements, a specially engineered system may be used. Such an engineered system shall provide 2500 cfm exhaust from a vestibule when in emergency operation and shall be sized to handle three vestibules simultaneously and the smoke detector located outside each vestibule shall release to open the supply and exhaust duct dampers in that affected vestibule.

4. Smoke Trap. The vestibule ceiling shall be at least 20 inches higher than the door opening into the vestibule to serve as a smoke and heat trap and to provide an upward moving air column.

5. Stair Shaft Air Movement System. The stair shaft shall be provided with mechanical supply and exhaust air. There shall be a minimum of 2500 cfm discharge at the top of the shaft. The supply shall be sufficient to provide a minimum of .05 inch of water column with respect to atmospheric pressure with all doors closed and a minimum of .10 inch water column difference between the stair shaft and the vestibule.

6. Exit Doors. The exit doors into the vestibule and into the stair shaft shall close automatically when released by activation of a detector which is sensitive to products of combustion, other than heat. The door holding devices shall be of an approved type which will release the doors so that they will close in the event of a power failure.

7. Operation of Ventilating Equipment. Vestibule and stair shaft mechanical ventilation may be inactive or may operate at reduced levels for normal operations as approved by the Depart-

ment; but when the detectors referred to in paragraph 6 either fail or are activated, the mechanical equipment shall operate at the levels specified in paragraphs 3 and 5.

8. **Emergency Power.** Mechanical ventilation equipment shall be provided by an approved self-contained generator set to operate whenever there is a loss of power in the normal house current. The generator shall be in a separate room having a minimum one-hour fire-resistive occupancy separation and shall have a minimum fuel supply adequate to operate the equipment for two hours.

9. **Acceptance and Testing.** Before the mechanical equipment is accepted by the Department, it shall be tested to confirm that the mechanical equipment is operating in compliance with these requirements.

10. **Emergency Lighting.** The stair shaft and the vestibule shall be provided with emergency lighting. The standby generator which is installed for the smokeproof enclosure mechanical ventilation equipment may be used for standby emergency lighting power supply.

11. **Air-conditioned Buildings.** In buildings with air conditioning systems or pressure air supply, serving more than one story, a detector of products of combustion other than heat shall be placed in the return air prior to exhausting from the building or being diluted by outside air. Upon activation the detector shall cause the return air to exhaust completely from the building without any recirculation through the building. Such devices may be installed in each room or space served by a return air duct.

SEC. 91.3310 — EXIT COURTS

(a) **General.** Every exit court shall discharge into a public way or exit passageway.

(b) **Width.** Exit court minimum widths shall be determined in accordance with provisions of Section 91.3302, based on the tributary occupancy load and such required width shall be unobstructed except for projections permitted in corridors in Section 91.3304.

Where the width is reduced from any cause the reduction shall be effected gradually by a guardrail at least 3 feet in height and making an angle of not more than 30° with the axis of the exit court.

(c) **Number of Exits.** Every exit court shall be provided with exits as determined by Section 91.3302.

(d) **Openings.** All openings into an exit court less than 10 feet wide shall be protected by fire assemblies having not less than a three-fourths-hour fire-protection rating.

EXCEPTION: *Openings more than 10 feet above the floor of the exit court may be unprotected.*

SEC. 91.3311 — EXIT PASSAGEWAYS

(a) **Discharge.** The walls of exit passageways shall be without openings other than required exits and shall have walls, floors, and ceilings of the same period of fire resistance as required for the walls, floors and ceilings of the building served with a minimum of one-hour fire-resistive construction. Exit openings throughout the enclosing walls of exit passageways shall be protected by fire assemblies having a three-fourths-hour fire-protection rating.

(b) **Detailed Requirements.** Exit passageways shall have width, height, and other construction requirements as required for corridors in Section 91.3304.

SEC. 91.3312 — EXIT AND EXIT SIGN ILLUMINATION

(a) **Exit Illumination.** Exit illumination shall be provided as required by Subsection (c) of Section 93.210-26 of the Los Angeles Municipal Code (Electrical Code).

(b) **Exit Signs.** An exit sign with letters at least six inches high shall be provided in a conspicuous location at every exit doorway for the following occupancies and whenever otherwise required to clearly indicate the direction of egress from areas serving the following occupancies:

1. All Groups A, B, S and D Occupancies;
2. Other occupancies having an occupant load of more than 100.

In interior stairways the floor level leading direct to the exterior of the building shall be clearly indicated.

(c) **Emergency Exit and Exit Sign Illumination.** Emergency exit and exit sign illumination shall be provided as required by Section 23, Division 700 of Article 3, Chapter 9 of the Los Angeles Municipal Code (Electrical Code).

SEC. 91.3313 — AISLES

(a) **General.** Every portion of every building in which are installed seats, tables, merchandise, equipment or similar materials shall be provided with aisles leading to an exit.

(b) **Width.** Every aisle shall be not less than 3 feet wide if serving only one side, and not less than 3 feet 6 inches wide if serving both sides. Such minimum width shall be measured at the point farthest from an exit, cross aisle, or foyer and shall be increased by 1½ inches for each 5 feet in length toward the exit, cross aisle or foyer.

With continental spacing, as specified in Section 91.3314(a), side aisles shall be not less than 44 inches in width.

(c) **Distances to Nearest Exit.** In areas occupied by seats, and in Groups A and B Occupancies without seats, the line of travel to an exit door by an aisle shall be not more than 150 feet.

(d) **Aisle Spacing.** With standard spacing, as specified in Section 91.3314(a), aisles shall be so located that there will be not more than six intervening seats between any seat and the nearest aisle.

With continental spacing, as specified in Section 91.3314(a), the number of intervening seats may be increased to 29 where exit doors are provided along each side aisle of the row of seats at the rate of one pair of exit doors for each five rows of seats. Such exit doors shall provide a minimum clear width of 66 inches.

(e) **Cross Aisles.** Aisles shall terminate in a cross aisle, foyer, or exit. The width of the cross aisle shall be not less than the sum of the required width of the widest aisle plus 50 percent of the total required width of the remaining aisles leading thereto. In Groups A, B, and S Occupancies, aisles shall not provide a dead end greater than 20 feet in length.

(f) **Vomitories.** Vomitories connecting the foyer or main exit with the cross aisles shall have a total width not less than the sum of the required width of the widest aisle leading thereto plus 50 percent of the total required width of the remaining aisles leading thereto.

(g) **Slope.** The slope portion of aisles shall not exceed 1 foot fall in 8 feet.

SEC. 91.3314 — SEAT SPACING

With standard seating the spacing of rows of seats shall provide a space of not less than 12 inches from the back of one seat to the front of the most forward projection of the seat immediately behind it as measured horizontally between vertical planes.

With continental seating, the spacing of rows of unoccupied seats shall provide a clear width measured horizontally as follows (automatic or self-rising seats shall be measured in the seat-up position, other seats shall be measured in the seat-down position):

Eighteen inches clear for rows of 18 seats or less;

Twenty inches clear for rows of 35 seats or less;

Twenty-one inches clear for rows of 45 seats or less;

Twenty-two inches clear for rows of 46 seats or more.

SEC. 91.3315 — EXITS: GROUP A OCCUPANCIES

(a) **Main Exit.** Every Group A Occupancy shall be provided with a main exit.

The main exit shall be of sufficient width to accommodate one-half of the total occupant load but shall be not less than the total required width of all aisles, exit passageways, and stairways leading thereto, and shall connect to a stairway or ramp leading to a public way.

(b) **Side Exits.** Every auditorium of a Group A Occupancy shall be provided with exits on each side. The exits on each side of the auditorium shall be of sufficient width to accommodate one-third of the total occupant load served. Side exits shall open directly to a public way or into an exit court, approved stairway, exterior stairway or exit passageway leading to a public way. Side exits shall be accessible from a cross aisle.

(c) **Balcony Exits.** Every balcony having an occupant load of more than 10 shall be provided with a minimum of two exits. Balcony exits shall open directly onto an exterior stairway or into an approved stairway or ramp. When there is more than one balcony, exits shall open into an exterior or enclosed stairway or ramp. Balcony exits shall be accessible from a cross aisle. The number and distribution of exits shall be as otherwise specified in this Division.

(d) **Panic Hardware.** An exit door from a Group A Occupancy having an occupant load of more than 100 shall not be provided with a latch or lock unless it is panic hardware.

SEC. 91.3316 — NO PROVISIONS**SEC. 91.3317 — NO PROVISIONS****SEC. 91.3318 — EXITS: GROUP D OCCUPANCIES**

(a) **Separate Access.** Every room in a Group D Occupancy shall have access to at least two approved means of egress from the building without passage through intervening rooms other than corridors or lobbies. All required exterior exit doors shall open in direction of exit travel.

(b) **Minimum Size of Exits.** Every exit opening through which patients are transported in wheelchairs, stretchers or beds shall be of sufficient width to permit the ready passage of such equipment, but shall have a clear width of not less than 44 inches. There shall be no projections within the 44-inch clear width.

(c) **Corridors.** The minimum clear width of a corridor shall be

44 inches, except that corridors serving any area housing one or more nonambulatory persons shall be not less than 8 feet in width. There shall be no change of elevation in a corridor serving nonambulatory persons unless ramps are used.

In Group D-1 Occupancies where open barred cells such as jails and reformatories form corridor walls, the corridors and cell doors need not be fire-resistive.

Double-acting doors may be placed across any required corridor, provided they have no locking or latching device and each leaf contains a vision panel.

EXCEPTIONS: 1. *Single swing fire doors with latching devices may be placed across corridors when required to create a horizontal exit by regulations of the State of California. The doors shall provide the size and hardware as required by this Division and one leaf shall swing in the direction of egress from each side of the separation. The doors shall be normally in the open position and operable by an approved heat and smoke-sensing device.*

2. *Single swing double leaf fire doors with latching devices may be placed across corridors in existing buildings to protect openings in smoke-stop partitions which are required by regulations of the State of California. The door size and hardware shall be as required by this Division and one leaf shall swing in the direction of egress from each side of the separation. The doors shall be normally in the open position and operable by an approved heat and smoke-sensing device. The prohibition of projections within the 44-inch clear width as specified in Section 91.3318(b) shall not apply to these door openings, provided all other provisions of Section 91.3318(b) are satisfied.*

(d) **Basement Exits.** One exit accessible to every room below grade shall lead directly to the exterior at grade level.

(e) **Ramps.** Group D-2 Occupancies housing nonambulatory patients shall have access to a ramp leading from the first story to the exterior of the building at the ground floor level.

(f) **Hardware.** Exit doors serving an occupant load of more than 50 shall not be provided with a latch or lock unless it is panic hardware. Patient room doors shall be readily openable from either side without the use of keys.

EXCEPTION: *No requirements of this Division shall be so construed as to prohibit the construction of cell blocks in jails or prevent the use of any locks or safety devices where it is necessary to forcibly restrain the inmates.*

(g) **Locking Devices.** In buildings housing occupancies in which the personal liberties of inmates or patients are restrained within the building and which are constructed in conformance with the special provisions of Section 91.0802(b), the exterior doors may be fastened with locks, provided that room doors shall not be fastened by other means than doorknobs or similar devices which can be opened readily from the corridor side without the use of keys or any special knowledge or effort.

SEC. 91.3319 — NO PROVISIONS

SEC. 91.3320 — SPECIAL EXIT REQUIREMENTS FOR HAZARDOUS ROOMS

(a) **Boiler, Furnace and Incinerator Rooms.** Except in Group R Occupancies, any room containing a boiler, furnace, incinerator, or other fuel-fired equipment must be provided with two means of egress when both of the following conditions exist:

1. The area of the room exceeds 500 square feet, and,

2. The largest piece of fuel-fired equipment exceeds 400,000 B.T.U. per hour input capacity.

If two means of egress must be provided, one may be a fixed ladder. The means of egress must be separated by a horizontal distance not less than half the greatest horizontal dimension of the room. Where oil-fired boilers are used, a 6-inch noncombustible sill (dike) shall be provided. There shall be no interior openings between a Group E Occupancy and an incinerator room.

(b) **Rooms Housing Hazardous Materials.** Exits from rooms housing hazardous materials shall be provided as set forth in Division 41.

SEC. 91.3321 — REVIEWING STANDS, GRANDSTANDS AND BLEACHERS

(a) **Scope.** Reviewing stands, grandstands and bleachers shall conform to the provisions of this Section.

(b) **Definitions.** For the purpose of this Section certain terms are defined as follows:

Bleachers. Bleachers are seating facilities without backrests in which an area of 3 square feet or less is assigned per person for computing the occupant load.

Footboards. Footboards are that part of a raised seating facility other than an aisle upon which the occupant walks to reach a seat.

Grandstands. Grandstands are tiered or stepped seating facilities wherein an area of more than 3 square feet is provided for each person.

Open Air Grandstands and Bleachers. Open air grandstands and bleachers shall refer to seating facilities which are located so that the side toward which the audience faces is unroofed and without an enclosing wall.

Permanent. Permanent stands are those seating facilities which remain at a location for more than 120 days.

Reviewing Stands. Reviewing stands are elevated platforms accommodating not more than 50 persons. Seating facilities, if provided, are normally in the nature of loose chairs. Reviewing stands accommodating more than 50 persons shall be regulated as grandstands.

Safe Dispersal Area. Safe dispersal area shall mean an area which will accommodate a number of persons equal to the total capacity of the stand and building which it serves in such a manner that no person within the area need be closer than 50 feet from the stand or building. Dispersal areas are based upon an area of not less than 3 square feet per person.

Temporary. Temporary seating facilities are those which are intended for use at a location for not more than 120 days.

(c) **Height of Grandstands and Bleachers.** See Section 91.1710-(c).

(d) **Design Requirements.** See Division 23.

(e) **General Requirements.** 1. **Row Spacing.** There shall be a clear space of not less than 12 inches measured horizontally between the back or backrest of each seat and the front of the seat immediately behind it. The minimum spacing of rows of seats measured from back to back shall be:

A. Twenty-two inches for seats without backrests.

B. Thirty inches for seats with backrests.

C. Thirty-three inches for chair seating.

2. **Rise Between Rows.** The maximum rise from one row of seats to the next shall not exceed 16 inches unless the seat spacing from back to back measured horizontally is 40 inches or more.

3. **Seating capacity determination.** Where bench-type seating is used, the number of seats shall be based on one person for each 18 inches of length of the bench.

4. **Aisles. A. Aisles Required.** Aisles shall be provided in all seating facilities except that aisles may be omitted when all of the following conditions exist:

- (i) Seats are without backrests.
- (ii) The rise from row to row does not exceed 12 inches per row.
- (iii) The number of rows does not exceed 11 in height.
- (iv) The top seating board is not over 10 feet above grade.
- (v) The first seating board is not more than 20 inches above grade.

B. Obstructions. No obstruction shall be placed in the required width of any aisle or exitway.

C. Width. Aisles serving seats on both sides shall have a minimum width of 42 inches. When serving seats on only one side, the aisle shall have a minimum width of 36 inches.

5. **Cross aisles and vomitories.** Cross aisles and vomitories shall be not less than 54 inches in clear width and shall extend to an exit, enclosed stairway or exterior perimeter ramp.

6. **Stairs and ramps.** All stairs and ramps shall have a maximum rise and run as provided in Section 91.3305(c) and Section 91.3306, except those within the seating area which serve as aisles at right angles to the rows of seats where the rise shall not exceed 8 inches. When an aisle terminates at an elevation more than 8 inches above grade, the aisle shall be provided with a stairway or ramp whose width is not less than the width of the aisle.

7. **Guardrails.** Perimeter guardrails or enclosing walls shall be provided for all portions of elevated seating facilities more than 30 inches above grade. Construction of guardrails shall comply with Sections 91.4404 and 91.2307(a).

EXCEPTION: Guardrails at the front and not at the end of an aisle may have a height of 36 inches and need not meet the 9-inch maximum spacing specified in Section 91.4404; however, a midrail shall be installed.

8. **Toeboards.** A 4-inch high vertical barrier shall be installed along the edge of walking surfaces wherever guardrails are required.

9. **Footboards.** Footboards shall be provided for all rows of seats above the third row or beginning at such a point where the seating plank is more than 2 feet above grade. Where the same platform is used for both seating and footrests, footrests will not be required, provided each level or platform is not less than 24 inches wide. Footboards in bleachers at a level below the seat board it serves are not to be considered as walking platforms but shall be not less than a structural grade of 2-inch by 8-inch lumber or equivalent. When bleachers exceed 11 rows in height, a walking platform not less than 18 inches in width shall be provided.

(f) **Special Requirements.** 1. **Grandstands and bleachers within buildings.** Except as otherwise provided in this Sub-

division, grandstands and bleachers within a building shall comply with the other applicable sections of Division 33.

EXCEPTION: When seats are without backrests there may be nine seats between any seat and an aisle.

2. Open-air grandstands and bleachers. Except as otherwise provided in this Subsection, open-air grandstands and bleachers shall comply with the other applicable sections of Division 33.

A. Number of seats between aisles. The number of seats between any seat and an aisle shall not be greater than 20 when the seats are without backrests and nine if the seats have backrests.

B. Dead ends. Dead ends in vertical aisles shall not exceed a depth of 16 rows for permanent grandstands and 26 rows for temporary grandstands.

C. Distance to exit. The line of travel from any seat to a safe dispersal area exit ramp, enclosed stairway or vomitory shall not be more than 200 feet. When the seats have no backrests, the distance may be measured by direct line.

D. Safe dispersal area. Each safe dispersal area shall have a minimum of two exits. If more than 6000 persons are to be accommodated within a dispersal area, there shall be a minimum of three exits and for more than 9000 persons there shall be at least four exits. The aggregate clear width of exits from a safe dispersal area shall be determined on the basis of not less than one exit unit of 22 inches for each 500 persons to be accommodated and no exit shall be less than 44 inches in width.

E. Two exits required. Two exits shall be provided from every grandstand or bleacher which accommodates more than 300 persons.

F. Three exits required. Three exits shall be required where a grandstand or bleacher or section thereof accommodates more than 1000 persons.

G. Four exits required. Four exits shall be provided where a grandstand or bleacher or section thereof accommodates more than 3000 persons.

H. Determination of exit width. The total width of exits in feet shall be not less than the total occupant load served divided by 150 when exiting by stairs and divided by 200 when exiting by ramps, corridors, tunnels or vomitories.

I. Minimum exit width. No exit shall be less than 42 inches in width.

SEC. 91.3322 — MALLS

(a) General. In addition to other provisions of the Los Angeles Municipal Code all malls shall conform to this section.

(b) Exits. All areas served by a mall and having an occupant load greater than 10 shall have at least one exit independent from the mall. All exit doors from the mall shall be provided with panic hardware or shall omit any lock or latch.

(c) Width. Temporary and incidental uses will be permitted in malls when approved by the Los Angeles Fire Department, however, temporary seating, assembly platforms or other obstructions shall not reduce the clear exit width of the mall to less than that required by Section 91.3302(b) or 20 feet, whichever is the greater width.

DIVISION 36 — ROOF STRUCTURES

SEC. 91.3601 — GENERAL

(a) **Limitations.** Every roof structure which exceeds the limitations established by the regulations of this Division shall be included in the height of and shall conform to the construction requirements of the building upon which it is erected.

(b) **Area Limits.** The aggregate area of all penthouses and roof structures other than skylights shall not exceed 33⅓% of the floor area sheltered by the roof upon which they are erected.

(c) **Height.** No portion of any roof structure shall be more than 30 feet above the highest elevation of the roof upon which it is erected.

EXCEPTIONS: 1. *The height of smokestacks and flag poles shall not be limited.*

2. *On a Type I building a roof structure may extend to an elevation not more than 50 feet above the highest elevation of the roof upon which it is erected.*

3. *Ornamental spires of incombustible construction, not used for any occupancy and bearing no lettering or advertising, may be of unlimited height when approved by the Department. Solid horizontal draft stops shall be provided to separate the spire from the building.*

(d) **Construction.** Except as specifically allowed for penthouses and skylights, every roof structure shall be made of incombustible materials, or of the same materials as the exterior walls of the supporting building.

EXCEPTIONS: 1. *A sign facing of combustible materials may be attached to a roof structure.*

2. *Flag poles may be of wood.*

3. *Cooling towers may be of wood if set back five feet from the exterior wall.*

(e) **Access Passageways.** An unobstructed passageway for the use of the Fire Department shall be provided at roof level through or around every roof structure. One passageway shall be provided for every 50 foot length or fraction thereof of roof structure. The passageway shall be not less than seven feet high and not less than three feet wide.

SEC. 91.3602 — PENTHOUSES

(a) **Height.** No portion of any penthouse shall be more than 20 feet above the highest elevation of the roof adjacent thereto.

EXCEPTION: *Any portion of a penthouse upon a Type I building may be not to exceed 35 feet above the highest elevation of the roof adjacent thereto.*

(b) **Use.** No penthouse shall be used for any purpose other than the shelter of an exitway or for protection of equipment necessary to the operation of the building.

(c) **Construction.** Exterior walls of penthouses shall be of incombustible one-hour fire-resistive construction. Floors and roofs of penthouses shall be constructed as required for the supporting building. The penthouse shall be enclosed as specified in Subsection 91.3308 (d).

EXCEPTIONS: 1. *Exterior walls of penthouses on Type V*

buildings may be of combustible one-hour fire-resistive construction.

2. Exterior walls of penthouses located more than 10 feet from an exterior wall on a Type III, III-A, or III-B building may be of combustible one-hour fire-resistive construction.

SEC. 91.3603 — SKYLIGHTS

(a) **Height.** No portion of any skylight shall be more than 10 feet above the highest portion of the roof adjacent thereto.

(b) **Area.** The aggregate area of all skylights shall not exceed 40% of the floor area sheltered by the roof upon which they are erected.

(c) **Frames.** All skylights shall have frames of corrosion-resistant metal not thinner than No. 24 gage and shall be designed to carry roof loads as set forth in Division 23.

*EXCEPTIONS: 1. Structural steel or iron shapes which are not exposed to the weather need not be corrosion-resistant.
2. Plain glass skylights may have frames of wood.*

(d) **Glazing.** Skylights shall be glazed either with wireglass or flat formed sections of approved plastics.

(e) **Wireglass.** Wireglass shall be not less than ¼ inch thick, and shall be reinforced with mesh of wire not smaller than No. 24 gage and having openings not greater than one inch square. Panes of flat wireglass shall not exceed 24 inches between supports. Panes of corrugated wireglass shall not exceed five feet between supports.

(f) **Approved Plastics** may be used in skylights installed on roofs in accordance with the following provisions:

1. The plastic shall be mounted at least 4 inches above the plane of the roof on a curb constructed with materials consistent with the construction of the roof upon which the skylight is mounted. The curb may be omitted in buildings of Types IV and V construction.

2. Flat or corrugated plastic lights shall slope at least 4:12 when mounted above the plane of the roof on a curb.

3. All skylights shall be so constructed as to comply with the roof loading requirements of this code.

4. The edges of the plastic lights or dome shall be protected by metal or noncombustible material, except when mounted in the plane of the roof.

5. The aggregate area of skylights shall not exceed 25 percent of the floor area of the room or space sheltered by the roof in which they are installed.

6. Each skylight unit may have a maximum area of 100 square feet.

7. Skylight units shall be installed on the roof with a minimum distance of 4 feet between units and, except for Groups H and R occupancies, not less than 4 feet from any exterior wall. In no case shall they extend into yards beyond a vertical plane where fire protection of wall openings is required.

EXCEPTIONS: 1. Provision 6 of Section 91.3603(f) need not be applied in the following cases:

A. When the building on which the skylights are located is not more than one story in height, the building has an exterior separation from other buildings of at least 30 feet, and the room or space sheltered by the roof is not classified in Subgroups D-1 or D-2 Occupancy or as a required means of egress.

B. When the plastic material meets the fire retardant requirements of the roof.

2. Except for Groups A, B-1, D and E Occupancies, approved plastic materials may be used beyond the limitations specified in provisions 6 and 7 of Section 91.3603(f) if used in a building equipped with an approved automatic sprinkler system.

(g) **Group R Occupancies.** Skylights in Type V buildings housing Group R Occupancies may be of wood sash and wireglass or approved plastics.

(h) **Greenhouses.** Greenhouses may have roofs of plain glass or approved plastics. Greenhouse sash may be of wood.

SEC. 91.3604 — MISCELLANEOUS ROOF STRUCTURES

(a) **Sawtooth Roofs and Monitors.** Vertical or steep portions of sawtooth or stepped roofs may be of the same construction as the remainder of the roof if all portions are below a plane rising from the exterior edge of the roof and sloping at the rate of two vertical to one horizontal. Any glass in a sawtooth roof or monitor shall be wired glass set in metal sash with metal angles or clips.

Where a fire resistive rating is not required for the roof structure, and in all buildings provided with an approved automatic fire extinguishing system, approved plastics may be used with or without sash as the light transmitting medium in monitors and sawtooth roofs subject to the following limitations:

1. **Allowable Areas.** The area of individual plastic glazing used in monitors and sawtooth glazing shall not exceed 200 square feet. The total aggregate area of plastics used in skylights, monitors and sawtooth glazing shall not exceed 30 percent of the floor area of the room or occupancy sheltered.

2. **Area Separations.** The areas of such plastic panels shall be separated from each other by a section of non-combustible material or by a section of the roofing material of the structure not less than 4 feet in length.

3. The lower edge of the plastic material shall be at least six inches above the horizontal surface of the roof and be protected by metal.

(b) **Walls.** No portions of any walls or parapets shall be at an elevation more than 20 feet above the highest elevation of the roof adjacent thereto.

(c) **Clerestory Windows.** Clerestory windows in the exterior wall above the roof of porches, canopies, or covered passages may be of the same materials as required for lower windows where such porches, canopies, or covered passages are of incombustible materials or of the same fire-resistive time period as the building to which they are attached.

DIVISION 37 — CHIMNEYS AND HEATING APPLIANCES

SEC. 91.3701 — GENERAL

(a) **General.** All chimneys and heating apparatus shall conform to the requirements of this Division except as further regulated by other requirements of this Code.

(b) **Venting.** Every combustion chamber shall be connected to a chimney or a metal smokestack.

EXCEPTION: Gas appliances may be vented as specified in Article 5, Chapter 9, of the Los Angeles Municipal Code (Heating, Ventilating, Air Conditioning and Refrigeration Code).

No flue or smokestack shall have smoke-pipe connections in more than one story.

(c) **Quality of Materials.** Applicable materials shall conform to the following standards.

<u>Material</u>	<u>Designation</u>
Fireclay Refractories	ASTM C 27
Fireclay Plastic Refractories	ASTM C 176
Castable Refractories	ASTM C 213
Refractories for Incinerators	ASTM C 108
Structural Concrete—To conform to requirements of Division 26	
Structural Masonry (other than Fireclay Refractories) to conform to requirements of Division 24	

Fireclay brick in all incinerators shall be laid with either fire-clay mortar conforming to ASTM Designation C 105 (High Duty or Super Duty) or air-setting refractory mortar conforming to ASTM Designation C 178 (High Duty or Super Duty).

SEC. 91.3702 — CHIMNEYS — GENERAL

(a) **Construction.** Every chimney shall have masonry or concrete walls at least eight inches in thickness not including flue lining. Every chimney shall be reinforced and anchored as required for bearing walls and shall be designed according to the requirements of Division 23.

EXCEPTION: Chimneys connected to portable heating devices in dwellings may be constructed of terra cotta pipe as specified in Section 91.3703.

Division walls separating flues in chimneys shall be at least four inches thick, including flue lining.

Every chimney shall be lined with fire-clay flue lining at least $\frac{3}{4}$ -inch thick or with a fire-brick lining not less than four inches thick. Flue lining shall extend from a point eight inches below the lowest inlet to the top of the chimney.

(b) **Inlet Thimbles.** Every inlet to any chimney shall be of cast iron or $\frac{3}{4}$ -inch thick refractory tile pipe. Every inlet shall be at least four inches from any combustible materials.

(c) **Height of Chimneys.** Every chimney shall extend to a point at least two feet above the highest elevation of any portion of the building within 10 feet of the chimney.

(d) **Fireplaces.** In a dwelling, apartment house, or hotel every fireplace shall be constructed as required by Section 91.4823. In a dwelling, every chimney connected to a heating device or fireplace may be constructed as specified in Section 91.4822.

(e) **Clearance.** All portions of every chimney shall be separated from all combustible materials by not less than one inch.

(f) **Spark Arresters.** Every chimney shall be equipped with a spark arrester of a type approved by the Los Angeles Fire Department.

(g) **Special Type Chimneys.** Special type chimneys may be used if approved by the Department and the Los Angeles Fire Department.

SEC. 91.3703 — TERRA COTTA CHIMNEYS

(a) **Construction.** Every terra cotta chimney shall be constructed of terra cotta pipe not more than six inches in inside diameter and not less than $\frac{3}{4}$ inch in shell thickness. All joints shall be filled with portland cement mortar.

(b) **Location.** Every terra cotta chimney shall be on an exterior wall of the building and shall be exposed to view.

Every portion of every terra cotta chimney shall be at least two inches from any combustible material.

(c) **Support.** A terra cotta chimney may be supported upon wood, if at least six inches of mortar separates the inlet to the chimney and the supporting wood.

SEC. 91.3704 — METAL SMOKESTACKS

(a) **Exterior Stacks.** Every exterior metal smokestack shall be distant at least 24 inches from any combustible materials and any wall opening or exitway.

(b) **Interior Stacks.** Every interior metal smokestack extending through any story or roof space shall be enclosed in a vertical shaft of two-hour fire-resistive construction. The shaft shall provide at least six inches of clearance on all sides of the stack and every opening in the stack shall be protected by a fire assembly having a one and one-half hour fire-resistive rating. The shaft shall have ventilating openings at top and bottom.

(c) **Height.** Every metal smokestack shall extend to a point at least two feet above the elevation of any roof within 10 feet of the stack.

(d) **Thickness.** Metal smokestacks shall be constructed of material not less than $\frac{1}{8}$ -inch in thickness, except that metal smokestacks attached to the exterior wall of incombustible buildings may be constructed of 18 gage galvanized metal.

SEC. 91.3705 — SMOKE PIPE

(a) **Definitions.** For the purpose of this Division, a smoke pipe is defined as a pipe connecting a combustion chamber with a chimney or smokestack.

(b) **Location.** Every smoke pipe shall be at least 12 inches from all combustible materials. All combustible materials within three feet of a smoke pipe shall be protected by fire-resistive plaster.

(c) **Thickness.** Every metal smoke pipe 12 inches or less in diameter shall be constructed of material not thinner than No. 22 gage. Every metal smoke pipe more than 12 inches in diameter shall be constructed of material not thinner than No. 18 gage.

SEC. 91.3706 — INCINERATORS

(a) **Scope.** In addition to the general requirements of this Code, every incinerator within or attached to a building or structure and every separate incinerator shall comply with the requirements of this Section.

EXCEPTION: Fireplaces and cooking devices shall not be included within the scope of this Section.

(b) **Construction.** The firebox, arch and secondary chambers of every incinerator shall be enclosed by masonry or concrete walls lined on the inside with approved refractories. Interior walls and partitions shall be lined with approved refractories.

The thickness of masonry or concrete enclosing walls and of refractory linings shall not be less than that set forth in Table No. 37-A for the incinerator grate area shown.

TABLE NO. 37-A
MINIMUM THICKNESS OF INCINERATOR WALLS AND
REFRACTORY WALLS

WALLS	GRATE AREA (in square feet)		
	0 to 10	10 to 28	Over 28
Total Thickness of wall & refractory lining.	4 inches	6 inches	12
Minimum thickness of refractory lining.	3 inches	4 inches	9

(c) **Guardrails.** Charging openings of roof or top loading incinerators shall be provided with guardrails to protect the operators.

(d) **Shaft Enclosure.** The incinerator refuse chute, flue and other portions which penetrate through floors of a building shall be enclosed in a shaft enclosure as required by Division 17 of this Article for the type of building. Chimneys constructed as required for a shaft enclosure need not be further enclosed.

(e) **Incinerator Rooms.** Every room housing an incinerator shall be separated from the remainder of the building by a one-hour fire-resistive occupancy separation.

Every incinerator room shall be provided with fresh air openings necessary to support combustion in the incinerator but not less than 200 square inches in area.

(f) **Refuse Chutes.** Refuse chutes from floors above shall not discharge directly into the firebox of an incinerator. Combination chute and flue types are prohibited.

(g) **Floors.** Every floor supporting an incinerator shall be constructed of incombustible materials.

(h) **Smoke Stacks and Chimneys.** All stacks and chimneys shall be lined with at least four inches of refractory material.

EXCEPTIONS: 1. Stacks having a cross-sectional area of less than 32½ square inches may be lined with two inches of refractory material.

2. Stacks having a cross-sectional area of more than 32½ square inches but less than 1,000 square inches may be lined with three inches of refractory material.

Steel stacks shall be constructed of not less than 10 gauge minimum thickness material.

(i) **Spark Arrestor.** Every incinerator located outside of a building and every incinerator stack shall be provided with a spark arrestor having openings not wider than $\frac{1}{2}$ inch.

(j) **Fire Department Approval.** Every incinerator outside of a building shall be located in a manner approved by the Los Angeles Fire Department.

SEC. 91.3707 — OTHER HEATING APPARATUS

Boilers and gas appliances shall be constructed and installed in accordance with the requirements of the Los Angeles Municipal Code.

DIVISION 39 — STAGES

SEC. 91.3901 — SCOPE

The requirements of this Division shall apply to any stage located within an A, B, or S Occupancy and used for bandstand or exhibition purposes or for theatrical or similar performances which may or may not require the use of a curtain, portable or fixed scenery, lights, or mechanical appliances.

EXCEPTIONS: *The following stages are exempt from the requirements of this Division: 1. Any stage less than 400 square feet in area;*

2. Stages entirely open to the assembly room on three or more sides;

3. Altars, pulpits, or platforms used only for religious worship.

SEC. 91.3902 — GENERAL CONSTRUCTION REQUIREMENTS

(a) **Materials.** Every stage shall have floors, walls, partitions and ceilings constructed of materials as required for the type of building in which it is located.

EXCEPTION: *Stage floors located above a concrete floor may be of two-inch nominal wood T & G sheathing, or 1½-inch plywood bonded with exterior glue, provided the understage area is completely enclosed and not used for any purpose.*

(b) **Fire Resistance.** The walls, partitions, and ceilings surrounding every stage shall be of not less than one-hour fire-resistive construction.

EXCEPTIONS: *1. Understage area enclosures not exceeding four feet in clear height may omit the required fireproofing on the inside of the enclosure, provided the understage area is completely enclosed and not used for any purpose other than chair storage as set forth in this exception or heating or ventilating duct installations not involving electrical equipment. Chair storage areas may be located under the stage, provided the interior surfaces of the storage area are lined with materials approved for one-hour fire-resistive construction, and the access doors are of not less than 1½ inch solid wood material or lined on the inside with No. 24 gage galvanized iron.*

2. Understage enclosures are not required where the understage area is completely sprinklered.

Heating or ventilating grill openings in the stage enclosure shall be protected by automatic fire shutters unless the duct is continuous through the enclosure.

SEC. 91.3903 — REQUIREMENTS FOR ALL STAGES

(a) **General.** Every stage unless exempted under the scope of this Division shall conform to the requirements of this Section.

(b) **Exits.** Every stage having an occupant load in excess of 50 shall have not less than two exits. Exits shall conform to the requirements of Division 33 of this Article.

(c) **Storage.** On-stage storage of props, scenery or sets is prohibited. Where such storage is necessary, a separate storage room shall be provided.

(d) **Sprinklers.** Every stage and every storage room accessory to a stage shall be completely sprinklered.

EXCEPTIONS: 1. Sprinklers are not required for any storage room or stage accessory to or part of a Group S Occupancy, provided the area of the stage does not exceed 500 square feet.

2. Sprinklers are not required for any stage or storage room accessory to an assembly room having a capacity of less than 300 occupants, including the occupant load of the stage area.

Understage areas exceeding four feet in clear height or 1,500 square feet in area shall be completely sprinklered where sprinklers are required for the stage above.

SEC. 91.3904 — ADDITIONAL REQUIREMENTS FOR STAGES ACCESSORY TO GROUP A OCCUPANCY ASSEMBLY ROOMS

(a) **General.** In addition to the requirements of Sections 91.3902 and 91.3903, every stage accessory to a Group A Occupancy assembly room shall conform to the requirements of this Section.

(b) **Proscenium Walls.** The stage shall be completely separated from the auditorium by a proscenium wall of not less than two-hour incombustible construction. The proscenium wall shall extend not less than four feet above the roof over the auditorium.

Proscenium walls may have, in addition to the main proscenium opening, one opening at the orchestra pit level and not more than two openings at the stage floor level, each of which shall be not more than 25 square feet in area.

All openings in the proscenium wall of a stage shall be protected by a fire assembly having a one and one-half-hour fire-resistive rating. The proscenium opening, which shall be the main opening for viewing performances, shall be provided with a proscenium curtain approved by the Los Angeles Fire Department.

(c) **Stage Ventilators. 1. General.** There shall be one or more ventilators constructed of metal or other incombustible material near the center and above the highest part of any working stage, raised above the stage roof and having a total ventilation area equal to at least five percent of the floor area within the stage walls.

2. Opening Action. Ventilators shall open by spring action or force of gravity sufficient to overcome the effects of neglect or expansion by heat or warping of the framework.

3. Glass. Glass, if used in ventilators, must be protected against falling on the stage. A wire screen, if used under the glass, must be so placed that if clogged it cannot reduce the required ventilating area or interfere with the operating mechanism or obstruct the distribution of water from the automatic fire-extinguishing systems.

4. Design. Ventilators and supporting framework shall be designed in accordance with Division 23.

5. Automatic Openings. Each ventilator shall be arranged to open automatically after the outbreak of fire by the use of an approved automatic closing device. The fusible link and operating cable shall hold each door closed against a minimum 30-pound counterforce exerted by springs or counterweights. This minimum counterforce shall be exerted on each door through its entire arc

of travel and for a minimum 115 degrees. A manual control shall be provided.

6. **Spring Actuation.** Springs, when employed to actuate ventilator doors, shall be capable of maintaining full required tension indefinitely. Springs shall not be stressed more than 50 percent of their rated capacity and shall not be located directly in the air stream, nor exposed to the elements.

7. **Location of Fusible Links.** A fusible link shall be placed in the cable control system on the underside of the ventilator at or above the roof line, or as approved by the Department and shall be so located as not to be affected by the operation of fire-extinguishing systems.

8. **Control.** Remote, manual or electrical control shall provide for both opening and closing of the ventilator doors for periodic testing and shall be located at a point on the stage designated by the Department. When remote control of ventilator is electrical, power failure shall not affect its instant operation in the event of fire. Hand winches may be employed to facilitate operation of manually controlled ventilators.

(d) **Gridirons, Fly Galleries and Pinrails.** Gridirons, fly galleries and pinrails shall be constructed of incombustible materials; and fire protection of iron and steel may be omitted. Gridirons and fly galleries shall be designed for the purpose intended as set forth in Division 23.

(e) **Standpipes.** Wet standpipes shall be provided at each side of the stage at the proscenium wall with one or more outlets in every hall or passageway on the stage side of the proscenium wall.

DIVISION 40 — MOTION PICTURE PROJECTION

SEC. 91.4001 — GENERAL

(a) **Scope.** The provisions of this Division are applicable to motion picture projection machines in which ribbon-type cellulose acetate, cellulose triacetate or other safety film is used in conjunction with electric arc, xenon or other light source projection equipment which develops hazardous gases, dust or radiation. (For motion picture projection machines in which cellulose nitrate [non-safety] film is used, the provisions of Article 29 of National Fire Protective Association pamphlet No. 40 entitled "Cellulose Nitrate Motion Picture Film" shall apply.)

(b) **Projection Room Required.** Every motion picture projection machine to which the provisions of this Division are applicable shall be enclosed in a projection room.

(c) **Posting Required.** A conspicuous sign stating "ONLY SAFETY FILM PERMITTED IN THIS ROOM" in one-inch block letters shall be posted on the outside of each projection room door and in a conspicuous location within the projection room.

SEC. 91.4002 — CONSTRUCTION

Every projection room shall have a floor area of not less than 80 square feet for a single machine, and at least 40 square feet for each additional machine. Each motion picture projector, floodlight, spotlight or similar piece of projection equipment shall have an accessible clear working space of not less than 30 inches by 30 inches on each side and at the rear of such equipment, but only one such space shall be required between two adjacent projectors.

The projection room and the adjacent accessory rooms shall have a ceiling height of not less than seven feet, six inches and shall be separated from the remainder of the building by permanent construction of not less than one-hour fire resistance.

Floors shall be structurally designed in accordance with Section 91.2302 for the special loads imposed by the equipment to be moved and located within the rooms.

SEC. 91.4003 — EXITS

Exits shall be provided as required by Division 33 but not less than one exit door conforming as an exit from a hazardous area shall be provided.

SEC. 91.4004 — PROJECTION PORTS AND OPENINGS

Openings in the wall between the projection room and the viewing room shall be completely closed with glass, and shall be limited to only the necessary projection and viewing openings. Such openings shall not exceed 25 percent of the area of the wall. Openings into other portions of the building shall be provided with closeable doors.

SEC. 91.4005 — VENTILATION

(a) **General.** Exhaust air ducts shall terminate at the exterior of the building in such a location that the exhaust air cannot be readily recirculated into the supply air system. Blower motors shall be located outside the duct systems.

(b) **Projection Room.** Every projection room shall be ventilated by a mechanical exhaust system providing a minimum of one change of air every three minutes. The exhaust air system may also serve adjoining accessory rooms but shall be independent of other air systems in the building. Fresh air shall be supplied to the projection room from an uninterruptible source by means of two or more separate inlet ducts with screened openings terminating within 12 inches of the floor and located at opposite ends of the room.

(c) **Projection Equipment.** Each projection machine shall be ventilated by a mechanical exhaust system which will draw air from each lamp and exhaust it directly to the outside of the building and such exhaust system shall not be interconnected with any other system. The exhaust capacity shall be as recommended by the equipment manufacturer but shall not be less than 200 cubic feet per minute for each electric arc lamp served or 300 cubic feet per minute for each xenon lamp served; however, the external operating temperature of the xenon lamp housing shall not exceed 130 degrees Fahrenheit.

SEC. 91.4006 — MISCELLANEOUS EQUIPMENT

Every projection room shall have rewind and film storage facilities.

A maximum of four, 16-ounce, nonbreakable containers for flammable liquids necessary for the operations of the room may be permitted in the room. Electrical equipment appurtenant to the projection equipment is permitted in the projection room or the adjoining accessory rooms.

SEC. 91.4007 — SANITARY FACILITIES

Every projection room shall be provided with a lavatory and, if serving an assembly occupancy, shall be provided with a water closet.

DIVISION 41 — SPECIAL ROOMS HOUSING HAZARDOUS MATERIALS—OR HAZARDOUS USES

SEC. 91.4101 — GENERAL

(a) **Scope.** Rooms conforming to the requirements of this Division may be used to house hazardous materials or hazardous uses as provided herein without being classified in a Subgroup occupancy different from the basic occupancy of the building.

SEC. 91.4102 — HAZARDOUS MATERIALS ROOM

(a) **Scope.** A room or separate building conforming to the requirements of this Section may be used for the storage and incidental dispensing of any hazardous material except those classified as an explosive material.

A hazardous materials room may be located within any building, provided that the materials to be located therein are required as accessory to the use or maintenance of the building.

(b) **Separation.** Every hazardous materials room shall be separated from an E, F, G or J Occupancy by at least a one-hour fire-resistive occupancy separation and shall be separated from any other occupancy by at least a two-hour fire-resistive occupancy separation.

(c) **Area.** The area of a hazardous materials room shall not exceed 500 square feet.

(d) **Number of Exits.** Two exits shall be provided if any part of the room is more than 15 feet distant from a single exit. The exits shall be reasonably separated so that if one becomes blocked the other will be available.

(e) **Exit Doors and Locks.** Where two exits are provided, a single sliding door not exceeding four feet in width may be used for one exit door.

Doors shall be openable from the inside without use of a key.

(f) **Type of Construction.** Every hazardous materials room shall be of at least one-hour fire-resistive construction throughout.

EXCEPTION: A separate building used as a hazardous materials room and provided with yards on all sides of 20 feet or more may be of incombustible construction throughout or may have unprotected wood roof or ceiling construction where the plastered walls extend to the roof sheathing.

(g) **Exterior Openings.** Exterior wall openings within 10 feet of and also facing a property line shall be protected by a stationary or self-closing fire assembly having a three-fourths hour fire-resistive rating.

EXCEPTION: Vents not exceeding 100 square inches in area and located at least five feet from any property line need not be protected.

(h) **Interior Openings.** Interior openings shall be prohibited except for exit and access purposes and for ventilation ducts conforming to the requirements of Section 91.1069 of this Article.

Every interior opening in a one-hour fire-resistive occupancy separation shall be protected by a self-closing or automatic fire assembly having a one-hour fire-resistive rating, except enclosed ventilation ducts. Every interior opening in a two-hour fire-resistive occupancy separation shall be protected by a self-closing

or automatic fire assembly having a one and one-half hour fire-resistive rating.

Where gaseous materials are to be stored within the room, interior openings shall be weatherstripped.

(i) **Floor Level.** The floor of every hazardous materials room shall not be more than six inches below the elevation of that portion of the public way or yard used for entrance to the ground floor of the building.

(j) **Floors. 1. Construction.** The floor of every hazardous materials room shall be constructed of concrete or other nonabsorbent incombustible material.

EXCEPTION: Wood floors covered with 2½ inches concrete reinforced with 1½ inches No. 17 gage or equivalent wire mesh may be used in lieu of a concrete floor.

2. **Liquid-tight floor and sill.** Every hazardous materials room used to house liquid materials shall be provided with liquid-tight construction consisting of four inches by four inches concrete or masonry curbs or walls around the perimeter of the room. Ramp type sills shall be provided at all door openings where fire-protected assemblies are required.

(k) **Ventilation.** Every hazardous materials room shall be provided with either a gravity or a mechanical exhaust ventilation system.

The mechanical exhaust ventilation system shall be of sufficient capacity to change the air in the room at least six times per hour where all doors are self-closing. Where automatic closing doors are provided, limit switches shall be installed so that the ventilation system is operating whenever a door is open and the system shall be of sufficient capacity to change the air in the room at least 12 times per hour. The operation of the mechanical exhaust system shall be controlled by a switch located outside of the room adjacent to an exit. The ventilating equipment and any lighting fixtures shall be operated by the same switch. A pilot light shall be installed adjacent to the switch if flammable gases, flammable liquids or liquefied flammable gases are dispensed or manifolded within the room.

The mechanical exhaust system shall conform to requirements of Section 91.1067 of this Article.

Where gravity ventilation is provided for required ventilation, the requirements of Section 91.1068 of this Article shall apply.

(l) **Electrical.** Electrical equipment and wiring shall be installed as required by the Electrical Code for the class of hazard involved.

(m) **Location of Exhaust Outlets.** Exhaust outlets shall be located as set forth in Division 5 of the Heating and Ventilating Code.

SEC. 91.4103 — SPRAY ROOMS

(a) **General.** Portions of Groups E, F or G Occupancies may be used for the spraying of paint or other flammable or combustible liquids if such use is confined to a spray room constructed as required by this Section, or is done in a spray booth or spray tunnel conforming to the provisions of Article 7, Chapter 5 of this Code (The Fire Prevention Code). Separate buildings may be used for spray painting if conforming to this Section.

(b) **Area.** The area of a spray room shall not exceed 2,000 square feet.

(c) **Construction.** Every spray room shall be of not less than

one-hour fire-resistive construction with all interior openings protected by a fire assembly having a one-hour fire-resistive rating.

Exterior wall openings within 20 feet of and also facing a property line or opposite side of a public way shall be protected by a fire assembly having a three-fourths hour fire-resistive rating.

EXCEPTIONS: 1. Interior or exterior openings not exceeding 20% of the area of the wall or ceiling in which the openings are located are permitted to be of wire glass not less than $\frac{1}{4}$ inch in thickness set in fixed metal sash.

2. Exterior or interior openings may be unprotected where the ventilation system is designed to operate with such openings serving as intake openings, provided the exterior openings face yards of not less than five feet in width.

(d) **Interior Surfaces.** The interior surface of every spray room including the interior surface of any connecting duct or pipe shall have a smooth finish.

(e) **Exits.** Exits and exit doors shall be provided as set forth in Section 91.1040 of this Article for Subgroup E-2 Occupancies.

(f) **Floor Covering.** All combustible flooring in a spray room shall be protected with a covering of incombustible material so installed as to prevent the combustible flooring from coming into contact with flammable liquids.

(g) **Ventilation.** A mechanical exhaust system of ventilation shall be provided for every spray room. The ventilation system shall be of sufficient capacity to create a uniform transfer of air across the room at a minimum rate of 100 lineal feet per minute, and shall discharge to the exterior of the building. Air intakes shall consist of ducts leading to the outside air or interior or exterior wall openings. Intake openings shall be uniformly distributed along the wall opposite from the exhaust system with not more than six lineal feet of wall between intake openings. At least 60% of the total intake area shall be located within 36 inches of the floor except where door openings are used for air intake purposes.

(h) **Electrical.** Electrical equipment and wiring shall be installed as required by the Electrical Code for the class of hazard involved.

SEC. 91.4104 — FILM VAULTS

(a) **Scope.** Every room used for the storage of cellulose-nitrate film shall be constructed as set forth in this Section.

(b) **Single Vaults.** The walls, floors and roof of single film vaults shall be constructed of reinforced masonry or of reinforced concrete and shall have a four-hour time period of fire resistance.

(c) **Multiple Vaults.** Walls and floors separating film vaults shall be constructed of reinforced masonry or reinforced concrete not less than eight inches thick.

(d) **Ceilings.** A fire-resistive plaster ceiling may be installed below the required roof to limit the net interior vault space.

(e) **Location.** No film vault shall be located below the top story of any building.

(f) **Openings.** There shall be no openings in the walls, floor and roof enclosing a film vault except one entrance and vents as prescribed by this Section.

EXCEPTION: Conduits and drainage pipes may be installed

in the walls or floor of film vaults, but shall not pass through walls or floors separating film vaults from each other or from other occupancies.

(g) **Doors.** The entrance shall be protected by two fire assemblies having a one-hour fire-resistive rating.

(h) **Vents.** Each film vault shall be provided with one or more screened vents having an aggregate area of not less than three square inches per cubic foot of vault capacity. The screen shall have openings not larger than $\frac{1}{4}$ inch square.

Each vent shall extend two feet above the roof of any building other than the vault within 25 feet and shall not be confluent with any other vent.

EXCEPTION: The vent need not extend above the roof of any building having four-hour fire-resistive walls with no openings within a horizontal distance of 25 feet of the vent.

Every vent shall be open or may be closed with plain glass not more than $\frac{1}{2}$ inch thick if a ventilating opening of at least 50 square inches is provided.

The walls of the vent shall be constructed as required for the walls of the vault.

(i) **Size of Vaults.** The net capacity of every film vault shall not exceed 750 cubic feet.

EXCEPTION: The net interior capacity may be increased to 1,500 cubic feet if all portions of the vault are not less than 25 feet from any other building.

(j) **Sprinklers.** Every film vault shall be completely sprinklered.

(k) **Heating.** Film vaults shall be unheated.

(l) **Electrical.** Electrical equipment and wiring shall be installed as required by the Electrical Code for the class of hazard involved.

SEC. 91.4105 — EXPLOSIVES VAULTS

(a) **Scope.** Every room appropriated to the storage of explosive materials shall conform to the requirements of this Section. Not more than 500 pounds of explosive materials shall be stored within any explosives vault.

(b) **Size.** An explosives vault shall not exceed 100 square feet in area and shall have a ceiling height of not more than nine feet.

(c) **Isolation.** Every explosives vault shall be a separate structure not more than one story in height and shall be isolated as set forth in Table No. 10-E of this Article.

(d) **Walls.** The walls of every explosives vault shall be of masonry or concrete, shall have a four-hour time period of fire-resistance, and shall be reinforced in two directions with reinforcement bars not less in diameter than $\frac{3}{8}$ inch spaced at not more than six inches center to center.

(e) **Floors.** The floor of every explosives vault shall be of concrete supported directly upon the ground.

(f) **Roof.** The roof of every explosives vault shall be of corrugated asbestos cement roofing.

(g) **Roof Vent.** There shall be two vents in the roof of every explosives vault. Each vent shall be not less in area than one square foot and shall be louvered or covered with $\frac{1}{4}$ inch mesh screen. Vents shall be located at opposite ends of the room.

(h) **Openings.** There shall be no openings in the walls, floor, and roof enclosing an explosives vault except one entrance and two vents as prescribed by this Section.

EXCEPTION: *Conduits may be installed in the walls or floor.*

(i) **Doors.** The entrance shall be provided with a fire assembly having a three-hour fire-resistive rating and shall be secured against unauthorized entry.

(j) **Heating.** Explosives vaults shall be unheated.

(k) **Electrical.** Electrical equipment and wiring shall be installed as required by the Electrical Code for the class of hazard involved.

SEC. 91.4106 — SPECIAL REQUIREMENTS FOR CELLULOSE-NITRATE FILM PROCESSING ROOMS AND MOTION PICTURE LABORATORIES AND CUTTING ROOMS

(a) **Scope.** This Section shall apply to every cellulose-nitrate film processing room and to every film laboratory, film exchange, or film cutting room housing cellulose-nitrate film.

(b) **Construction.** Every room under the scope of this Section shall be constructed as set forth in Division 10 of this Article for a Subgroup E-1 Occupancy.

(c) **Storage.** Film vaults shall conform to the requirements of Section 91.4104 of this Division.

(d) **Vents.** A vent to the outer air shall be installed in each room. The vent shall have an area of two square inches for each cubic foot of room capacity. The vent shall terminate as specified in Section 91.4104(h).

Each vent opening directly to the exterior shall be protected against the weather by single thickness glass, 1/16th-inch thick, painted a dark color, or by other incombustible fragile material in a sash arranged to open outward automatically in case of fire by the use of an approved releasing device placed inside the room.

The area of the glass shall be the effective sectional area of the vent opening. No pane of glass shall be smaller than 200 square inches. A light wire screen not coarser than ¼-inch mesh shall also be placed over each vent, so arranged as not to interfere with the automatic operation of the sash bars or screen; if, in addition, to said light wire screen, a second screen is used as protection against burglary or injury to contents, it shall have a mesh of not less than four inches and shall be located inside the light wire screen and shall give a net opening equal to that required for the vent.

(e) **Openings in Partitions.** Openings in partitions shall be protected by a fire assembly having a one-hour fire-resistive rating.

(f) **Exits.** Exit doors shall swing in the direction of exit travel.

(g) **Room Sizes.** Individual rooms used for film cutting shall be not greater in area than 300 square feet. The area of a cellulose-nitrate processing room shall not exceed 2,000 square feet.

(h) **Heating Equipment.** Warm air furnaces and gas, oil, and electrical heaters shall not be used to heat a cellulose-nitrate processing room.

(i) **Electrical.** Electrical equipment and wiring shall be installed as required by the Electrical Code for the class of hazard involved.

SEC. 91.4107 — TRANSFORMER VAULTS

Every transformer within a building shall comply with the requirements of Division 450 of Article 3 of Chapter IX of the Los Angeles Municipal Code (Electrical Code).

SEC. 91.4108 — REFRIGERATION MACHINERY ROOMS

Refrigeration systems and the requirements for refrigeration machinery rooms shall comply with the provisions set forth in Division 12 of Article 5 of Chapter 9 of the Los Angeles Municipal Code (Heating, Ventilating, Air Conditioning and Refrigeration Code).

SEC. 91.4109 — BOILER ROOMS

(a) **General.** For the purpose of this Section, every boiler room shall be classified in the following types:

1. **Type A** — Every boiler room not classified as Type B or Type C.

2. **Type B** — A boiler room housing steam or hot water boilers protected with low water cutoff devices or hot water heaters, having a combined input rating in excess of 1,000,000 British Thermal Units per hour and using fuel gas.

3. **Type C** — A boiler room housing approved steam or hot water boilers protected with low water cutoff devices or hot water heaters, having a combined input of 1,000,000 or less British Thermal Units per hour, using fuel gas, and enclosed in an insulated cabinet.

(b) **Fire Resistive Separation.**

Type A

1. Every Type A boiler room shall be separated from any Group A, B, D, E, or S Occupancy by a four-hour fire-resistive separation.

EXCEPTION: A Type A boiler room in a Subgroup B-2 Occupancy may be separated from the rest of the building by a three-hour fire-resistive separation, provided any opening in such separation is not on the same floor as the assembly room which established the Subgroup B-2 Occupancy.

2. Every Type A boiler room shall be separated from any other occupancy by a two-hour fire-resistive separation with openings protected by a fire assembly having a one and one-half hour fire-resistive rating.

3. If within 20 feet of a property line, exterior walls of a Type A boiler room shall be a minimum of two-hour fire-resistive construction. Openings if permitted for the occupancy shall be protected as required for that occupancy with a fire assembly having at least a three-fourths hour fire-resistive rating.

EXCEPTION: Openings used for ventilation and not required by the occupancy to be protected may be unprotected if the total area of the openings does not exceed the area required by Subsection (c) of this Section.

Type B

1. Every Type B boiler room shall be separated from the rest of the building by a one-hour fire-resistive separation.

EXCEPTION: A Type B boiler room located in a building exceeding three stories in height or in a Group E Occupancy shall be separated as required for Type A boiler rooms.

2. Every Type B boiler room shall have interior openings protected by a fire assembly having a one-hour fire-resistive rating.

EXCEPTION: A Type B boiler room located in a building exceeding three stories in height or in a Group E Occupancy shall have interior openings protected by a fire assembly having a three-hour fire-resistive rating.

Type C

1. Type C boiler rooms need not be separated by fire-rated construction from the remainder of the building.

(c) **Standpipes.** A wet standpipe outlet shall be installed outside of every Type A or Type B boiler room adjacent to the boiler room exit door.

EXCEPTION: Wet standpipes are not required where the entire basement or story, including the boiler room, is sprinklered.

(d) **Exits.** Every Type A or Type B boiler room shall be provided with at least two means of exit, one of which may be a ladder.

(e) **Combustion Air and Ventilation.** Combustion air and ventilation shall be provided as required in Articles 4, 5 or 7 of Chapter 9 of the Los Angeles Municipal Code.

SEC. 91.4110 — DRYING ROOMS

Every room appropriated to drying or heat treating in which the temperature is maintained at a point higher than 125°F. but not higher than 200°F. shall be separated from other portions of the building by a one-hour fire-resistive separation.

Every room appropriated to drying or heat treating in which the temperature is maintained at a point higher than 200°F. shall be separated from other portions of the building by a three-hour fire-resistive separation.

SEC. 91.4111 — WARM AIR FURNACES

Every warm air furnace shall be separated from every Group A, B, D, E, F, and S Occupancy by one-hour fire-resistive construction with all openings in such separation protected by a fire assembly having a one-hour fire-resistive rating, or with fire dampers in the case of ventilating duct or air duct openings.

EXCEPTIONS: 1. Ventilating duct or air duct openings in such separation walls may omit the damper if the duct in the furnace room is covered with 3 inches of noncombustible insulation, and a manual reset temperature limit control switch, set for 250°F to cut off the fuel supply, is installed in the largest duct within 3 feet of the furnace.

2. The floor of any furnace enclosure required by this Section may be constructed of concrete or masonry not less than two inches in thickness supported on wood framing.

3. The requirements of this Section shall not apply to any furnace installed on the roof of a building.

SEC. 91.4112 — LIQUID FUEL POWERED MOTOR GENERATOR

Every liquid fuel powered motor generator shall be housed in a room of one-hour, fire-resistive construction. Every opening, except vents, shall be provided with a 1½ inch self-closing solid wood core or equivalent door.

Every motor generator room shall be provided with a minimum of 144 square inches of ventilating area located not more than 12 inches above the finished floor and 144 square inches of ventilating area located within 12 inches of the ceiling, opening directly to the outside of any building, or shall be protected by fire dampers.

Motor exhaust shall be carried to the outside air by means of a vent which shall be of sufficient size to accommodate the motor and which shall not be terminated within 10 feet of any building opening, air conditioning system intake, or the surface of any public sidewalk, street or alley. When such motor exhaust duct is installed within six inches of combustible material, it shall be protected by ½ inch asbestos or equivalent insulation.

The floor of every motor generator room shall be of incombustible material.

The floor area of any motor generator room shall be sufficient to provide at least a three-foot clear working space between such motor generator unit and any wall of the room, but shall not exceed a maximum of 150 square feet.

EXCEPTIONS: 1. Any liquid fuel powered motor generator, when installed in any Group G Occupancy, may be housed in a room of incombustible construction without time period fire-resistive rating, provided such room complies with this Subsection in other respects.

2. Any liquid fuel powered motor generator, having a rated capacity of three kilowatts or less, when installed in any Group G Occupancy need not be housed in a one-hour, fire-resistive room, provided such generator is protected as required by the Los Angeles Fire Department.

3. The floor area may be permitted to exceed 150 square feet provided substantiating data is submitted indicating the need for larger area.

SEC. 91.4113 — RUBBISH ROOMS

Every room, except a room in a Group R Occupancy, appropriated for the storage or treatment of combustible rubbish, shall be of one-hour fire-resistive construction. All openings in interior partitions shall be protected by not less than one fire assembly having a one-hour fire-resistive rating. All openings in exterior walls shall be protected by a fire assembly having a three-fourths hour fire-resistive rating.

DIVISION 42 — INTERIOR WALL AND CEILING FINISH

SEC. 91.4201 — GENERAL

Interior wall and ceiling finish shall mean interior wainscotting, paneling, or other finish applied structurally or for decoration, acoustical correction, surface insulation, or similar purposes. Requirements for finishes shall not apply to trim, defined as picture molds, chair rails, baseboards, and handrails; to doors and windows or their frames, nor to materials which are less than 1/28 inch in thickness (0.036") cemented to the surface of walls or ceilings, if these materials have flame-spread characteristics no greater than paper of this thickness cemented to a noncombustible backing.

SEC. 91.4202 — TESTING AND CLASSIFICATION OF MATERIALS

(a) **Testing.** Tests shall be made by an approved testing agency to establish flame-spread characteristics and to show that materials when cemented or otherwise fastened in place will not readily become detached when subjected to room temperatures of 300°F. for 25 minutes. Flame-spread characteristics shall be determined by one of the following methods:

1. The "Tunnel Test" as set forth in ASTM E84.
2. Any other recognized method of test procedure for determining the flame-spread characteristics of finish materials that will give comparable results to those specified in Method No. 1 above.

(b) **Classification.** The classes of materials based upon their flame-spread characteristics under the Tunnel Test shall be as set forth in Table No. 42-A. The smoke density shall be as determined when tested in accordance with ASTM E84 in the way intended for use. The products of combustion shall be no more toxic than the burning of untreated wood under similar conditions.

SEC. 91.4203 — APPLICATION OF CONTROLLED INTERIOR FINISH

Interior finish materials applied to walls and ceilings shall be tested as specified in Sec. 91.4202 and regulated for purposes of limiting flame spread by the following provisions:

1. When walls and ceilings are required by any provision in this Code to be of fire-resistive or noncombustible construction, the finish material of any class shall be applied directly against such fire-resistive construction or to furring strips not exceeding 1½ inches applied directly against such surfaces. The intervening spaces between such furring strips shall be filled with inorganic or Class I material.

2. Where walls and ceilings are required to be of fire-resistive or noncombustible construction and walls are set out or ceilings are dropped distances greater than specified in paragraph 1 of this Section, Class I finish materials shall be used except where the finish materials are protected on both sides by automatic fire-extinguishing systems or are attached to an incombustible backing or to furring strips installed as specified in paragraph 1. The hangers and assembly members of such dropped ceilings that are below the main ceiling line shall be of incombustible materials except that in Types III, III-A, III-B and V construction fire-retardant treated wood may be used. The construction of each set-out wall shall be of fire-resistive construction as required elsewhere in this Code.

3. Wall and ceiling finish materials of all classes as permitted in this Division may be installed directly against the wood decking or planking of Heavy-Timber Construction or to wood furring strips applied directly to the wood decking or planking installed and fire-stopped 8 feet o.c. both ways.

4. All interior wall or ceiling finish other than Class I material which is less than 1/4 inch thick shall be applied directly against an incombustible backing unless the qualifying tests were made with the material suspended from the incombustible backing.

TABLE NO. 42-A — FLAME-SPREAD CLASSIFICATION

MATERIAL QUALIFIED BY:	
Class	Tunnel Test
I	0- 25
II	26- 75
III	76-200

SEC. 91.4204 — FINISHES BASED ON OCCUPANCY

The maximum flame-spread and smoke-density numerical classification of interior finish, as determined by tests, shall be based on use or occupancy as set forth in Table No. 42-B.

EXCEPTIONS: 1. Except in Group D Occupancy and in vertical exitways, Class III may be used in other exitways and rooms as wainscoting extending not more than 48 inches above the floor and for tack and bulletin boards covering not more than 5 percent of the gross wall area of the room.

2. Where approved full fire-extinguishing system protection is provided and is not required by other provisions of this Code, the flame-spread classification rating may be reduced one classification, but in no case shall materials having a classification greater than Class III be used.

3. The exposed faces of Heavy Timber Construction conforming to Section 91.4303(g) are excluded from flame-spread requirements.

**TABLE NO. 42-B — MAXIMUM INTERIOR FINISH
NUMERICAL CLASSIFICATIONS**

OCCUPANCY GROUP	VERTICAL EXITWAYS		OTHER EXITWAYS (4)		ROOMS OR AREAS (4)	
	Flame Spread	Smoke Density	Flame Spread	Smoke Density	Flame Spread	Smoke Density
A	I	150	II	300	III	450
B	I	150	II	300	III	450
S	I	150	II	300	III	450
D	I	150	II	300	II ⁽¹⁾	300
E	I	150	II	300	III ⁽²⁾	450
F	I	150	II	300	III	450
G	I	150	II	300	III	450
H	I	150	II	300	III ⁽³⁾	450
R	III	450	III	450	III ⁽³⁾	450
J	NO RESTRICTIONS					

NOTES:

- (1) In rooms in which personal liberties of occupants are forcibly restrained, Class I material with smoke density of 150 only may be used.
- (2) In buildings over two stories, shall be of Class II.
- (3) Flame-spread provisions are not applicable to kitchens and bathrooms within the residential unit.
- (4) Class I materials only may be used in malls and Class I or II materials only in areas open to malls.

DIVISION 43 — FIRE-RESISTIVE STANDARDS

SEC. 91.4301 — GENERAL

For the purpose of determining time periods of fire resistance, as required by the provisions of this Code, materials of construction shall be assumed to have the fire-resistive ratings given herein. The fire-resistive rating of other materials of construction shall be determined by test as specified in "Standard Specifications for Fire Tests of Building Construction and Materials", A.S.T.M. Serial Designation E119 with the following additional requirement:

1. Tests for prestressed concrete shall be subject to the approval of the Superintendent of Building.

SEE RULE OF GENERAL APPLICATION #6-66 IN APPENDIX SECTION

SEC. 91.4302 — FIRE-RESISTIVE MATERIALS

(a) **Concrete and Pneumatically Placed Concrete.** Concrete and pneumatically placed concrete used for the fire-protection of structural members shall conform to the requirements of Division 26.

(b) **Masonry.** Masonry shall conform to the requirements of Division 24.

(c) **Gypsum.** Gypsum shall conform to the requirements of Division 24.

(d) **Lathing and Plastering.** All lathing and plastering required for fire resistance shall conform to the requirements of Division 47.

(e) **Reinforcement for Cast-in-Place Protection.** All reinforcement for cast-in-place protection for structural members shall be mesh or wire not smaller than No. 10 gauge spaced not more than six inches longitudinally and not more than 12 inches transversely.

EXCEPTION: Cast-in-place gypsum may be reinforced with No. 14 gauge wire mesh with openings not larger than four inches by four inches.

SEC. 91.4303 — FIRE-RESISTIVE CONSTRUCTION

(a) **Concrete-Reinforcement Protection.** For reinforced concrete members, the thickness of the protection shall be measured to the outside of the reinforcement, except that stirrups and ties may project not more than $\frac{1}{2}$ inch into the protection.

(c) **Suspended Ceilings.** Suspended ceilings shall be constructed as specified in Division 47 (Lathing and Plastering).

(d) **Unit Masonry.** Unit masonry protection for metal columns shall have metal ties embedded in each transverse joint, where joints are more than 15 inches apart, and shall be spaced not more than 15 inches in other cases. Soffit tile protecting beam and girder flanges shall be tied to the flange. Ties shall have a cross-sectional area equal to that of No. 8 gauge wire.

(e) **Cast-in-place Protection.** Reinforcement for cast-in-place protection of structural members shall be embedded at least $\frac{1}{4}$ inch in the protective covering but shall not be in contact with the face of the member.

(f) **Conduits and Pipes.** Conduits and pipes may be embedded in fire-protection material for structural members, provided such

TABLE NO 43-A — RATED FIRE-RESISTIVE PERIODS FOR PROTECTION OF STRUCTURAL ELEMENTS⁽¹⁾

STRUCTURAL PARTS TO BE PROTECTED	INSULATING MATERIAL USED	MINIMUM THICKNESS OF MATERIAL IN INCHES FOR THE FOLLOWING FIRE-RESISTIVE PERIOD			
		4-Hr.	3-Hr.	2-Hr.	1-Hr.
1. Steel or cast iron columns; individual truss members	Concrete	2½ ^a	2 ^a	1½	1½
	Brick (common), end or edge, ¾" mortar on flange, solid concrete or brick fill				2%
	Brick (common), flat ½" mortar on flange, solid concrete or brick fill	3%	3%	3½ ^a	3½ ^a
	Clay tile (2" minimum thickness) solid concrete or brick fill to web	5	2½	2 ^a	2 ^a
	Gypsum block (2" minimum thickness) solid, ½" gypsum plaster	2½	2½	2½	2½
	Gypsum block, hollow, ½" gypsum plaster	3½	3½	3½	3½
	Approved vermiculite, or perlite, 3.4-pound metal lath cage 1½" from flange		1	¾	¾
	Approved vermiculite or perlite, 3.4-pound self-furring metal lath cage against flanges	1½	1½	1	
	Approved vermiculite or perlite, 3.4-pound metal lath cage furled from flanges by ¾" channels at 2'0" o.c.	1½			
	Thickness of approved vermiculite or perlite plaster over 2 layers of ½" gypsum lath wrapped with 1" galv. 20 gage wire mesh. (Note 2)	1½	1		
	Thickness of approved vermiculite or perlite plaster over 1 layer of ¾" gypsum lath. (Note 2)		1%	1	
	2 layers 3.4-pound metal lath, sanded gypsum plaster, ¾" space between layers			2½	
	Thickness of sanded gypsum plaster over 1 layer of ¾" gypsum lath. (Note 2)		2	1½	½
	1 layer 3.4-pound metal lath, ¾" sanded gypsum plaster				¾
	1 layer 3.4-pound metal lath, 1" cement plaster				1
	Three ¾" Type "X" gypsum wallboards individually fastened to 1½" 25 gage steel studs at column corners with No. 6 x 1" screws at 24" o.c., No. 6 x 1½" at 12" o.c. and No. 8 x 2½" at 12" o.c. Middle layer tied with double strand No. 18 wire at 24" o.c.	1%			
	Concrete (distance is from main reinforcement). Hoops, ties, and stirrups may extend not over ½" into fire-protection	2½ ^a	2 ^a	2 ^a	1½
2. Reinforcing steel in concrete columns, beams, girders and trusses (Not prestressed)					

TABLE NO. 43-A—(Continued)

STRUCTURAL PARTS TO BE PROTECTED	INSULATING MATERIAL USED	MINIMUM THICKNESS OF MATERIAL IN INCHES FOR THE FOLLOWING FIRE-RESISTIVE PERIOD			
		4-Hr.	3-Hr.	2-Hr.	1-Hr.
3. Reinforcing steel in reinforced concrete joists (Not prestressed)	Concrete	1½	1½	¾	¾
4. Reinforcing and tie rods in floor and roof slabs. (Not prestressed)	Concrete (thickness includes fire-resistive plaster)	1	1	¾	¾
5. Prestressing rods or cables in prestressed concrete girders, beams and joists with the following cross-sectional area (in sq. in.) (Notes 4, 5, and 6) 40 to 150 150 to 300 Over 300	Concrete				
	Concrete	4°	3°	2½° 2	2 1½ 1½
6. Prestressing rods or cables in prestressed concrete slabs, solid or cored. (Note 4)	Concrete	2½	2	1½	1
	Concrete	2½¹	2¹	1½	1½
	Gypsum block (2" minimum thickness) solid, ½" gypsum plaster	2½	2½	2½	2½
	Gypsum block, hollow, ½" gypsum plaster	3½	3½	3½	3½
	Approved vermiculite or perlite, 3.4-pound metal lath cage 1½" from flange or 3.4-pound metal lath ceiling solid to, or below flange	1	¾	¾	¾
	Unsandwiched wood-fibered gypsum plaster, 3.4-pound metal lath cage or ceiling below lowest part of truss or beam		1	¾	¾
	Sanded gypsum plaster, 3.4-pound metal lath cage or ceiling below lowest part of truss or beam			¾	¾
	Cement plaster, 3.4-pound metal lath cage or ceiling below lowest part of truss or beam			1	¾
	Approved vermiculite or perlite 3.4-pound metal lath cage solid to beam flanges		¾	¾	¾

- Where approved lightweight aggregates, burnt clay, or shale are used, the minimum thickness of the fire protection may be reduced by one-half inch (½").
- Lath shall be applied tight against column flanges and tied with double strands of 18 gage tie wire at 15" o.c.
- No solid fill required.
- Unbonded-tendon anchorage devices shall have 50% greater coverage than that indicated in the table. Coverage may be reduced ½ inch for bonded tendons required by the Table to have two inches or more of cover.
- In computing the cross-sectional area, the area of any flange shall be omitted.
- Adequate provisions against spalling shall be provided by means of wire mesh reinforcement. The mesh shall have a maximum wire spacing of 6" and shall be located to provide a concrete cover of 1" minimum and 1½" maximum.
- Generic fire resistance ratings (those not designated by Company code letter) as listed in the Design Data-Fire Resistance Manual* 1973-74 Edition as published by the Gypsum Association may be accepted as if herein listed, provided the specified fire rating is maintained where gypsum wallboards terminate or frame into adjacent structural elements. (*To obtain this manual see advertisement, page 6.)

conduits and pipes have the minimum fire protection specified in Table No. 43-A for the adjacent structural member.

Occasional pipes, conduits, sleeves and electrical outlets of copper, clay, concrete, sheet steel or ferrous construction may pass through fire-resistive walls and floor systems where in the opinion of the Superintendent of Building the required fire-resistance is not unduly impaired.

EXCEPTIONS: 1. One electrical conduit, not more than $\frac{3}{4}$ inch, or two $\frac{1}{2}$ -inch, conduit size may be placed against a steel column flange in the required fireproofing material.

2. Outlets or switchboxes not greater in size than five inches by five inches by $1\frac{1}{2}$ inches may be attached to a steel column flange in required fireproofing material.

(g) **Heavy Timber Construction.** The following wood structural members shall be assumed to have a fire-resistive time period of one hour if all structural connections are of metal:

1. Wood columns having no dimension less than eight inches;
2. Wood beams and girders having no dimension less than six inches. Beams may be solid or laminated and bolted;
3. Wood floors and partitions not less than four inches thick, either of tongue and groove or laminated construction;
4. Roof-truss members having no dimension less than four inches;
5. Roof sheathing not less than $2\frac{1}{2}$ inches thick;
6. Roof arches, not supporting floor loads, which spring from the floor line and have dimensions of not less than 6-inch width for the full length, 8-inch depth in the lower half of the arch height and 6-inch depth in the upper half of the arch height.

The dimensions shown in this subsection are nominal sizes, but standard dressed sizes for sawn lumber are allowed. Glued laminated columns, beams, girders and arches shall have actual surfaced dimensions within one inch of the nominal sizes.

SEC. 91.4304 — PROTECTION OF STRUCTURAL ELEMENTS

The thickness of fire-resistive materials for protection of structural elements shall be not less than the amounts shown in Table No. 43-A of this Division. The figures shown shall be the net thickness of the protecting materials and shall not include any hollow space back of the protection.

EXCEPTIONS: 1. The edges of lugs, brackets, rivets and bolt heads attached to structural members may extend to within one inch of the surface of the fire-protective covering.

2. When the required fire-resistive rating as set forth in Table No. 43-C for a combination ceiling and floor or ceiling and roof is provided to protect structural elements other than columns, the structural elements need not be individually fire protected except where such members support loads from more than one floor or roof. The ceilings shall be continuous with no openings except electrical outlet boxes, steel or cast iron pipe, or incombustible ducts, all of which openings shall be subject to Department approval and shall not aggregate more than 100 square inches in any 100 square feet of ceiling area. All duct openings must be properly protected by approved fire dampers at the ceiling and floor line.

Where access is required to the space between the floor and the protective envelope ceiling, a fire assembly having a one-hour fire-resistive rating shall be provided. The loca-

TABLE NO. 43-B — RATED FIRE-RESISTIVE PERIODS FOR WALLS AND PARTITIONS⁽¹⁾

MATERIALS	CONSTRUCTION ⁽²⁾	MINIMUM THICKNESS ⁽¹⁾ FACE TO FACE (INCHES)			
		4-Hr.	3-Hr.	2-Hr.	1-Hr.
1. Reinforced concrete	Solid, no plaster	8	6½	5½	4½
	Solid, ½" plaster both faces	6	6	4½	4½
2. Brick of clay or concrete	Solid, unreinforced walls	12	8	8	3½
	Solid, reinforced, bearing walls	8	8	8	8
3. Brick face, structural clay, tile back	Solid, reinforced, bearing walls. Requirements per Division 24 (reinforced grouted masonry)	8	8	8	8
	Grouted, reinforced, bearing walls. Cells vertical	10	10	8	8
4. Hollow clay tile ASTM designation C34	Non-load-bearing, ½" sanded gypsum plaster both sides. Cells vertical			6	4
	Reinforced as required in Section 91.26 for bearing walls	8	6½	5½	4½
5. Hollow clay tile ASTM designation C56	Expanded slag or pumice	4.7	4.0	3.2	2.1
	Expanded clay or shale	5.7	4.8	3.8	2.6
6. Pneumatically-placed concrete	Limestone, cinders or air cooled slag	5.9	5.0	4.0	2.7
	Calcareous or siliceous gravel (normal stone aggregate)	6.2	5.3	4.2	2.8
7. Concrete Masonry Units ⁽³⁾	3" block, non-bearing, no plaster				3
	3" block with ½" gypsum plaster both sides, non-bearing			4	
8. Hollow gypsum block	4" block, non-bearing, gypsum plaster one side only			4½	
	Incombustible studs, 2.5-pound metal lath, sanded gypsum plaster, non-bearing				2
9. Solid plaster partition	Incombustible studs at 16" o.c., 3.4-pound metal lath, unsanded wood-fibered gypsum plaster, non-bearing			2	2
	Incombustible studs, 3.4-pound metal lath, approved vermiculite or perlite, non-bearing			2½	2
	Studless, non-bearing ½" plain gypsum lath, approved vermiculite or perlite. Metal runners			2½	2
	Studless, non-bearing, ½" gypsum lath, sanded gypsum plaster. Approved wood or metal runners ⁽⁴⁾				2
	Studless, non-bearing, 3.4 pound metal lath, sanded gypsum plaster. Metal runners ⁽⁴⁾				2

TABLE NO 43-B—(Continued)

MATERIALS	CONSTRUCTION	MINIMUM THICKNESS FACE TO FACE (INCHES)			
		4-Hr.	3-Hr.	2-Hr.	1-Hr.
10. Hollow incombustible stud partition	Non-bearing, 3.4-pound metal lath, plastered both sides with: ¾" sanded gypsum plaster(4) ⅝" cement plaster				3½ 3¾
	3.4-pound metal lath 1" unsanded gypsum plaster or approved vermiculite or perlite plaster, both sides EXCEPTION: 1" cement plaster may be used on exterior surfaces.			5	
	Bearing studs, 3.4-pound metal lath, ¾" sanded gypsum plaster or approved vermiculite or perlite plaster, both sides EXCEPTION: ⅝" cement plaster may be used on exterior surfaces.				4½ 4¾
	¾" approved "Type X" wallboard attached to 3½" steel studs with 2½" 8d nails 8" o.c. Studs attached to 16 ga. steel runners. Joints cemented and taped. Nail heads cemented. Non-bearing.				4¾
	¾" gypsum perlite or vermiculite plaster on ¾" perforated gypsum lath attached to 2½" steel studs with metal wire clips. Studs attached to metal runners with stud shoes and tie wire. Mix scratch and brown 100# gypsum plaster to 2 cu. ft. of perlite or vermiculite. Non-bearing.			4¾	
	One full-length, ½" Type "X" gypsum wallboard, vertical, each side, attached to 25 gage, channel studs at 24" o.c. by No. 6 x 1" screws at 8" o.c. on panel perimeter and 12" o.c. on other studs. Joints cemented and taped. (Horizontal application may be used if joints on opposite sides of wall are staggered.) Non-bearing.				2¾
	Two full-length ½" Type "X" gypsum wallboards, vertical, each side. Base layer attached to 25 gage, channel studs at 24" o.c. by No. 6 x 1" screws at 8" o.c. on panel perimeter and 12" o.c. on other studs. Face layer staggered one stud space, fully bonded using an approved adhesive, and with 1½" screws at panel corners. Face joints cemented and taped. Non-bearing.			3¾	

TABLE NO. 43-B — (Continued)

MATERIALS	CONSTRUCTION	MINIMUM THICKNESS FACE TO FACE (INCHES)			
		4-Hr.	3-Hr.	2-Hr.	1-Hr.
11. Hollow, gypsum lath and plaster partition	Non-bearing $\frac{1}{2}$ " plain gypsum lath sanded gypsum plaster both sides. Metal or approved wood runners, approved clip system 4 layers $\frac{1}{2}$ " gypsum board. (Joints staggered, metal runners)				4 or 6 2
12. Solid gypsum board partition	1" thick center core and $\frac{1}{2}$ " approved Type "X" gypsum wallboard surface layers laminated to core vertically with joints staggered, or 1" interlocking factory laminated core and $\frac{1}{2}$ " gypsum boards. All exposed joints cemented and taped. Non-bearing.		2		
13. Hollow gypsum board partition	$\frac{3}{4}$ " approved "Type X" gypsum wallboard. Surface layers reinforced with 6" wide by 1" (solid or laminated) wallboard strips 24" o.c. Surface layer secured to wood runners. If metal runners are used assembly is noncombustible. All joints cemented and taped. Non-bearing. One $\frac{1}{2}$ " gypsum wallboard laminated over 1", V edge, gypsum backing board on each side of runner, attached at 24" o.c. to runners. Full-length vertical boards, fully bonded using an approved adhesive. Face joints cemented and taped. Non-bearing.			4%	2 $\frac{1}{4}$
14. Wood stud partition	$\frac{1}{4}$ " perforated gypsum lath, 1" galv. 20 gage wire mesh furred out 5/16" and 1" perlite gypsum plaster both sides Studs covered on both sides with 3.4-pound metal lath and a 1" thickness of unsanded wood-fibered gypsum plaster or approved gypsum vermiculite or perlite plaster EXCEPTION: Cement plaster may be used on exterior surfaces			6%	5%

(1) Thicknesses shown for brick and clay tile are nominal thicknesses unless plastered, in which case thicknesses are net. Thicknesses shown for concrete masonry units are "equivalent thickness" as defined in Section 91.4305(e). Thickness includes plaster, lath and gypsum wallboard where mentioned and grout when all cells are solidly grouted.

(2) The equivalent thickness may include the thickness of Portland cement plaster or 1.5 times the thickness of gypsum plaster applied in accordance with the requirements of Division 47.

(3) Two layers $\frac{1}{2}$ -inch gypsum board with staggered joints may be used in lieu of gypsum lath and plaster in interior locations only.

(4) Plaster shall be one part gypsum to one part sand by weight for scratch coat, and one part gypsum to two parts sand by weight for brown coat.

(5) Generic fire resistance ratings (those not designated by Company code letter) as listed on the Design Data-Fire Resistance Manual* 1973-74 Edition as published by the Gypsum Association may be accepted as if herein listed except for assemblies WP1075, WP1240, WP2920, WP5120, WP6020, WP6025 and WP9325 and provided further, that in all cases, all exposed joints shall be cemented and taped. (*To obtain this manual, see advertisement, page 6.)

TABLE NO 43-B—(Continued)

MATERIALS	CONSTRUCTION	MINIMUM THICKNESS FACE TO FACE (INCHES)			
		4-Hr.	3-Hr.	2-Hr.	1-Hr.
14. Wood stud partition (continued)	2" x 4" studs 16" o.c. plastered both sides with: ¾" sanded gypsum plaster ⁽⁴⁾ ½" cement plaster				5% 5%
	3.4-pound metal lath or ¾" gypsum lath, unsanded gypsum plaster, or approved vermiculite or perlite plaster, both sides				5%
	¾" gypsum lath, ½" sanded gypsum plaster, both sides				5%
	Two layers ¾" approved "Type X" gypsum wallboard secured to wood studs with cement coated nails. Each layer may be erected vertical or horizontal, provided the joints of the opposing first layer are staggered and that joints with respect to the first and second layers are staggered. The base layer may be secured with either 2" nails at 9" o.c. or 1½" nails at 6" o.c. The face layer may be nailed with 2½" nails at 7" o.c. or 1½" nails 12" o.c. and an adhesive. All joints cemented and taped covered with joint compound.			6%	
	¾" approved "Type X" wallboard nailed at 7" o.c. to wood studs with 1½" nails. Joints cemented and taped.				4%
	¾" "Type X" gypsum lath, ½" unsanded gypsum plaster, sanded gypsum plaster, or approved vermiculite or perlite plaster, both sides with aggregate, the mix ratio is 100 pounds of gypsum to 2 cubic feet of aggregate.				5%
	¾" drop siding or ¾" exterior type plywood over ½" gypsum sheathing on exterior surface of 2" x 4" wood studs at 16" o.c. with interior surface as required for one-hour rated 2" x 4" stud partition. Sheathing — use galvanized, 1½" x No. 11 gage, 7/16" head nails at 8" o.c. Siding use 7d, galv., smooth box nails. Plywood — use galv. 6d siding or casing nails at 6" o.c. at panel edges, 12" o.c. interior.				varies

tion and size of such door or doors and the closing and latching devices are subject to the approval of the Department.

In one-hour ceilings which do not provide fire protection of structural frame members required by Table No. 17-A, an access door constructed as required for the ceiling may be used when approved by the Department.

SEE RULE OF GENERAL APPLICATION #2-69 IN APPENDIX SECTION

SEC. 91.4305 — FIRE-RESISTIVE WALLS AND PARTITIONS

(a) **Ratings.** Walls and partitions shall be assumed to have the fire-resistive time periods shown in Table No. 43-B of this Division.

Where the thickness of gypsum plastering used to provide required fire resistance is not specified in this Code, the thickness shall be not less than $\frac{3}{4}$ inch, except that the thickness of gypsum lath may be considered as equivalent to $\frac{1}{4}$ inch of plaster.

(b) **Design.** In addition to the requirements for fire-resistive construction in this Division, all walls and partitions shall comply with the design and construction requirements of this Code.

(c) **Minimum Thickness.** The tabulated minimum thickness shown in Table No. 43-B may be reduced by $\frac{1}{4}$ the thickness at the ends of wood members projecting into solid masonry or concrete walls.

(d) **Exception.** In lieu of one-hour fire-resistive construction, walls which enclose vertical shafts not more than nine square feet in cross-sectional area may be of one-inch boards covered on both sides with metal not thinner than No. 24 gage. Openings into the shaft enclosure shall be protected by a fire assembly having a three-fourths hour fire-resistive rating or may be protected by self-closing doors of the same construction as the walls.

RULE OF GENERAL APPLICATION #5-68 APPLIES. SEE APPENDIX LISTING.

(e) **Equivalent Thickness.** Equivalent thickness is defined as the average thickness of solid material in the wall and is represented by the formula:

$$T_L = \frac{V_n}{LH}$$

WHERE:

- T_L = Equivalent thickness in inches
 V_n = Net volume (gross volume less volume of voids) in cubic inches.
 L = Length of block in inches.
 H = Height of block in inches

SEC. 91.4306 — FIRE-RESISTIVE FLOOR AND CEILING CONSTRUCTION

(a) **Ratings.** Floors and ceilings of various types of construction shall be assumed to have fire-resistive time periods as exhibited in Table No. 43-C.

Where the thickness of gypsum plastering used to provide required fire resistance is not specified in this Code, the thickness shall be not less than $\frac{3}{4}$ inch, except that the thickness of gypsum lath may be considered as equivalent to $\frac{1}{4}$ inch of plaster.

(b) **Steel Joists and Roof Trusses.** In lieu of fire-protection requirements listed in Table No. 43-A, steel joists and roof truss

TABLE NO. 43-C — RATED FIRE-RESISTIVE PERIODS FOR VARIOUS FLOORS, CEILINGS AND ROOFS⁽¹⁾

MATERIALS	CONSTRUCTION	MINIMUM THICKNESS FACE TO FACE (INCHES)			
		4-Hr.	3-Hr.	2-Hr.	1-Hr.
1. Concrete	Slab or arch (no ceiling required)	6½	5½	4½	3½
2. Solid masonry	Slab or arch (no ceiling required)	4	3	2½	2½
3. Concrete joist construction	Thickness of top slab without ceiling	6½	5½	4½	3½
	Thickness of top slab with ¾" fire-resistive plaster ceiling			2½	2
4. Steel joist or steel floor construction with 2½" concrete slab on top (6)	Thickness of fire-resistive plaster ceiling	2	1½	¾	¾
	Thickness of pneumatically applied mortar ceiling	1½	1	¾	¾
	Thickness of approved vermiculite or perlite plaster ceiling	1	¾	¾	¾
	Thickness of Type "X" gypsum wallboard attached to ½" deep by 2½" wide, 25 gage, hat-shaped furring channels spaced at 12" o.c. with No. 6 x 1" screws at 8" o.c. Joints cemented and taped.			¾	
5. Steel joist or steel floor construction 24" o.c. with 2" concrete slab on top (6)	Thickness of fire-resistive ceiling. ¾" perforated gypsum lath shall be attached with approved clips to ¾" cold-rolled channels spaced 12" o.c.			1	¾
	Thickness of approved vermiculite or perlite plaster ceiling	1	¾	¾	¾
	Thickness of Type "X" gypsum wallboard secured to ½" — 25 gage nailing channels spaced 16" o.c. with No. 11 gage by 1¼" long, 5/16" head, ring shanked or barbed nails at 7" o.c. Joints cemented and taped.				¾
6. Steel roof deck construction with 2" approved vermiculite or perlite concrete slab on top	Thickness of approved vermiculite or perlite plaster ceiling applied to 3.4-pound metal lath				
	Thickness of sanded gypsum plaster ceiling applied to 3.4-pound metal lath	1		¾	¾
7. Steel joists or light steel construction with 2" pre-cast or poured gypsum slab on top	Thickness of approved vermiculite or perlite plaster ceiling applied to 3.4-pound metal lath			¾	¾
	Thickness of gypsum slab reinforced with mesh on ½" gypsum formboards placed on unprotected tees at 32½" on center. Butt joints of formboards shall be located over protected beams			2½ ^a	2
8. Poured Gypsum Slab					

NOTES: (1) Plaster shall be unsanded wood-fibered gypsum plaster. Wherever fiber-resistive plaster is specified, approved gypsum vermiculite or perlite plaster may be used of the same thickness. (2) No. 14 gage galvanized wire secured diagonally to clips or channels at each intersection. (3) Wire mesh tied to each furring channel, at joints, between adjacent lath. (4) Roofs may be sheathed with a single layer of ¾-inch sheathing or ¾-inch plywood, provided the roof is surfaced with a fire-retardant roofing. (5) Mesh shall be self-furring or otherwise supported ½" clear above the top of the formboard. (6) Electrical and telephone raceways may be installed in 2-hour concrete-steel deck assemblies, provided approved fire proofing applied under the raceway and the steel deck extends a minimum of 6-inches to each side of the raceway and is not less than 1½ inches in thickness. (7) Generic fire resistance ratings (those not designated by Company code letter) as listed in the Design Data-Fire Resistance Manual 1973-1974 Edition as published by the Gypsum Association[®] may be accepted as if herein listed except for assemblies FC2120, FC5230, and FC5430 and provided further, that in all cases, all exposed wallboard joints shall be cemented and taped and that in the case of double floor assemblies, building paper shall be provided in accordance with Section 91.4306(e). (*To obtain this manual, see advertisement, page 6.)

TABLE NO 43-C—(Continued)

MATERIALS	CONSTRUCTION	MINIMUM THICKNESS FACE TO FACE (INCHES)			
		4-Hr.	8-Hr.	2-Hr.	1-Hr.
9. Steel joist or light steel construction with 2" concrete or gypsum slab on top with attached or suspended ceiling of $\frac{3}{8}$ " perforated gypsum lath attached with approved clips giving continuous support to lath. All corners of gypsum lath to be joined with lath clips. (6)	Thickness of approved vermiculite or perlite plaster, $\frac{3}{4}$ " channels 16" on center				$\frac{1}{2}$
	Thickness of approved vermiculite or perlite plaster, $\frac{3}{4}$ " channels 16" on center, No. 14 gauge diagonal wire ²			$\frac{1}{2}$	
	Thickness of approved vermiculite or perlite plaster, $\frac{3}{4}$ " channels 16" on center, plaster reinforcement with No. 20 gage 1" wire mesh ³		$\frac{1}{2}$		
	Thickness of approved vermiculite or perlite plaster, $\frac{3}{4}$ " channels 12" on center, No. 14 gage diagonal wire ²		$\frac{1}{2}$		
	Thickness of approved vermiculite or perlite plaster, $\frac{3}{4}$ " channels 12" on center, plaster reinforcement with No. 20 gage 1" wire mesh ³	1			
10. Steel roof deck construction with 1" approved insulating material on top	Thickness of sanded gypsum plaster ceiling applied to 3.4-pound metal lath				$\frac{1}{2}$
11. Steel roof deck construction with 1½" approved insulating material on top	Thickness of sanded gypsum plaster ceiling applied to 3.4-pound metal lath			$\frac{3}{8}$	
12. Steel plate floor construction	Thickness of fire-resistive plaster ceiling				$\frac{1}{2}$
	Thickness of fire-resistive plaster ceiling				$\frac{1}{2}$
13. Wood joists and trusses with double floor on top ⁴	Thickness of approved "Type X" lath nailed to the bottom of joists 16" o.c. 3" wide 2.5# metal lath or equivalent wire lath at all joists. $\frac{1}{2}$ " thickness sanded gypsum plaster.				$\frac{1}{2}$
	Thickness of approved "Type X" wallboard nailed to the bottom surface of joists at 16" o.c. with 1½" cement coated nails 6" o.c. Joints cemented and taped.				$\frac{1}{2}$

See footnotes on preceding page.

members, may have fire protection as set forth in Table No. 43-C.

(c) **Plaster Ceilings.** Required thickness of reinforced concrete floor slabs may be reduced $\frac{1}{2}$ inch where ceiling of fire-resistive plaster is applied to the under side.

(d) **Roof trusses in Groups A, B, and S Occupancies.** Fire protection for roof trusses may be reduced under certain conditions in Groups A, B, and S Occupancies as specified in Section 91.1708.

(e) **Double Floors.** Double wood floors, if required by Table No. 43-C, shall consist of a subfloor of one-inch nominal wood sheathing, or $\frac{5}{8}$ -inch plywood, and a finish surface consisting of tongue and groove flooring or a layer of $\frac{3}{4}$ -inch plywood having joints staggered with respect to the surface below or $1\frac{1}{2}$ -inch minimum thickness slab of concrete or similar incombustible material. Building paper must be laid between subfloor and the finished floor.

EXCEPTIONS: 1. Where the finish surface material is $\frac{3}{4}$ -inch tongue and groove plywood the subfloor may be $\frac{1}{2}$ -inch plywood.

2. In lieu of the double layer wood floor in one-hour fire-resistive construction, a single layer of $1\frac{1}{2}$ inch plywood may be used, provided all panel joints are tongue ($\frac{1}{8}$ " projection) and groove unless centered over four-inch wide supports.

SEC. 91.4307 — FIRE-RESISTIVE PROTECTION FOR OPENINGS

(a) **Scope.** Fire doors and windows wherever specified in this Code shall meet the requirements of this Section for fire assemblies.

(b) **Definitions.** Wherever the fire protection of openings is specified in this Code, it shall be understood to mean a fire assembly as defined in this Section.

A fire assembly is the assembly of a fire door or fire window including all required hardware, anchorage, frames and sills.

A fire damper is an automatic-closing, metal assembly of one or more louvers, blades, slats or vanes installed in ducts to control the spread of fire.

Fire assembly, automatic closing, is a fire assembly which may remain in an open position and which will close automatically when the temperature of a heat-actuated device reaches 165 degrees Fahrenheit or 50 degrees above maximum room temperature under normal conditions. Heat-actuated devices shall be installed, one on each side of the wall at the top of the opening and one on each side of the wall at ceiling height where the ceiling height is more than three feet above the opening. The heat-actuated device for openings requiring one and one-half, one, or three-fourths-hour fire assemblies, and which are not exit doors, may consist of a single fusible link incorporated in the closing device. Latching or bolting devices, where required, shall operate automatically when the door closes. The action of any single device shall close all interconnected units of the assembly.

Fire assembly, self-closing, is a fire assembly which is normally kept in a closed position and which will, when opened, close and latch by gravity, or by the action of a mechanical device. This also includes fire assemblies which are released to close from the open position by the action of an approved device which is sensitive to products of combustion, other than heat. Self-closing assemblies shall have no attachments which will interfere with the closing and latching of the doors.

(c) **Identification of Fire Assemblies.** All fire assemblies used for opening protection requirements of this Code shall bear a label or other identification showing the rating thereof. Such label or identification shall be issued by an approved testing agency having a service for the inspection of materials and workmanship at the factory during fabrication and assembly.

EXCEPTIONS: 1. The Department may waive the requirement for labels on fire door assemblies which are too large to be labeled provided a certificate of inspection is furnished by an approved testing agency, which has a reinspection service verifying that the oversize door complies with the design, materials, and construction requirements of a labeled fire door of the class under consideration.

2. Dampers listed by the California State Fire Marshal may be used in the locations specified by Section 91.4307(g).

1. Fire assemblies having a three-hour fire-resistive rating shall be equipped with an automatic closing device as specified in Subsection 91.4307(b). Glazed openings shall not be allowed.

2. Fire assemblies having a one and one-half hour or one-hour fire-resistive rating and installed in openings in vertical shaft enclosures or two-hour fire-resistive separations shall be equipped with an automatic or self-closing device as specified in Subsection 91.4307(b). The one-hour rated assembly is limited to use in openings in construction required to have a maximum of one-hour fire resistance.

The temperature rise on the unexposed face of fire assemblies used in exit enclosures shall not exceed 450°F at the end of 30 minutes of fire exposure in accordance with the method specified in ASTM E152 and this performance rating shall be indicated on the label.

Glass panels in each door shall be limited to one observation panel not exceeding 12 inches in width or height and 100 square inches in area.

3. Fire assemblies having a one-hour fire-resistive rating, or three-fourths hour rating, if including glass panels over 100 square inches, and used in openings in corridor and room partitions and one-hour fire-resistive separations, shall be equipped with an automatic or self-closing device as specified in Subsection 91.4307(b).

Individual glass lights in glazed openings shall not exceed 1296 square inches in area.

4. Fire assemblies having a one and one-half hour fire-resistive rating and installed in openings in exterior walls shall be equipped with an automatic closing device as specified in Subsection 91.4307(b) and shall be without glazed openings.

5. Fire assemblies having a three-fourths hour fire-resistive rating and installed in openings in exterior walls shall have latching hardware but shall not be required to be equipped with closing devices.

Three-fourths hour fire windows which do not comply with the identification requirements of this Subsection may be used if the unit bears the manufacturer's label, has provision for glazing with ¼-inch wire glass and conforms to one of the following:

A. Solid section steel window frame 1¼-inch minimum depth. The main frame, ventilator, and muntin section shall be not less than ½-inch in thickness and be assembled by welding, riveting or interlocking together. Windows shall be limited to 12 feet, one inch, in either dimension and a maximum area of 84

square feet and may be provided with ventilators of hinged, pivoted, sliding, or projected types, not to exceed 60 inches in either dimension or not more than 3,000 square inches in area.

Individual windows installed two or more in one opening and joined by vertical mullions shall not exceed seven feet in width and 12 feet in height.

The exposed area per light of glass shall not exceed 350 square inches. The inside of glazed windows shall be provided with glazing angles for the entire perimeter of the light. Outside glazed windows shall be prepared for putty glazing with wire clips.

All windows shall be equipped with manufacturer's standard locking hardware and erection fittings;

B. Solid section window frame — one-inch minimum depth. The main frame, ventilator, and muntin sections shall be not less than $\frac{1}{4}$ -inch in thickness and be assembled by welding, riveting or interlocking together. Windows shall be limited to six feet, six inches in either dimension and a maximum area of 32 square feet and may be provided with ventilators of hinged or projected type not to exceed 24 inches by 48 inches.

The exposed area per light of glass shall not exceed 200 square inches. The windows to be outside putty glazed and be prepared for wire glazing clips.

All windows shall be equipped with manufacturer's standard locking hardware and erection fittings.

C. Cold-formed steel window frame double hung type. The members, except frame sill and head cover strips, shall be rolled or formed of No. 18 gage minimum galvanized steel or No. 16 gage minimum plain steel and be assembled by welding or riveting. Frame sill members shall be of No. 14 gage minimum galvanized or plain steel. Head cover strips shall be of No. 22 gage minimum galvanized steel.

Windows shall be limited to six feet in width and 10 feet in height.

The exposed area per light of glass shall not exceed 505 square inches when $1\frac{1}{2}$ -inch wide muntins are used, or 720 square inches when $1\frac{3}{4}$ -inch wide muntins are used. The sash shall be provided with inside glass stops for the entire perimeter of each light.

All windows shall be counterweighted and be equipped with the manufacturer's standard locking hardware and erection fittings.

(d) Fire-Resistance Tests. The fire-resistance time rating of fire windows and fire doors, other than elevator doors, shall be determined in the manner prescribed in the "Methods of Fire Tests of Window Assemblies", A.S.T.M. No. E163 and "Standard Methods of Fire Tests of Door Assemblies", A.S.T.M. No. E152. The rating of elevator doors shall comply with "Fire Tests of Door Assemblies", U.L. 10(b).

The fire-resistive time rating of fire dampers shall be as tested and listed by an approved testing agency, or constructed in accordance with the requirements of the Los Angeles Heating, Ventilating, Air Conditioning and Refrigeration Code.

(e) Glass. Glass used in fire assemblies shall be not less than $\frac{1}{4}$ -inch thick and shall be reinforced with fully embedded wire mesh of No. 24 gage or heavier, with openings not larger than one-inch square.

Glass shall be held in place by metal glazing angles, except that in casement windows wire clips may be used.

(f) Installation. Fire doors and fire windows shall be installed as specified in the "Standard for Fire Doors and Windows"

N.F.P.A. No. 80. Fire dampers shall be installed in accordance with the requirements of the Los Angeles Heating, Ventilating, Air Conditioning and Refrigeration Code.

(g) **Fire Dampers.** Where other provisions of this Code require protection of openings in a fire-resistive wall or ceiling, fire dampers may be installed in air duct openings in the following cases:

1. Openings in interior walls of one or two-hour fire-resistive construction.
2. Openings in exterior walls except where a fire assembly of more than one and one-half hour fire-resistance is required.
3. Openings in fire-resistive ceilings of floor-ceiling assemblies.

Fire dampers may be installed in openings in exterior walls, other than duct openings, when such use is approved by the General Manager.

The area of openings protected by dampers shall be included in the determination of the maximum allowable area of openings permitted in the wall.

***EXCEPTION:** No fire damper will be allowed in any combustion air opening or duct. This provision shall not be construed to waive any required fire-resistive separation.*

Openings in two-hour division walls shall be protected with one approved testing agency listed and labeled one and one-half hour rated damper in the opening, or with two City of Los Angeles approved dampers in the opening with one damper located on each side of the wall. Any one opening shall not exceed 30 inches in the greater dimension and there shall not be more than two such openings in any one wall. Dampers are not allowed for openings in four-hour division walls.

Openings in occupancy separation walls and exterior walls shall not exceed five feet in the greatest dimension. Dampers are not allowed for openings in three or four-hour occupancy separation walls.

(h) **Laundry and Rubbish Chute Doors.** Doors to laundry and rubbish chutes may be constructed of No. 14 gage steel or cast iron without a time period fire-resistive rating, provided they are of the hopper design, hinged at the bottom and either counterbalanced or equipped with a spring which will return and hold the door in a tightly closed position after being opened.

(i) **Frames.** All openings which are required to be protected with fire doors shall have frames which bear the label of the Underwriters' Laboratories, Inc., or shall have frames which meet with the requirements of this Subsection.

Frames shall be constructed of structural or sheet steel channels of sufficient width to lap the sides of the wall or partition. Frames in concrete or masonry walls need not exceed four inches in width.

Structural steel channel frames may be used for all types of fire doors. Sheet steel channel frames not less in thickness than No. 14 gage may be used for all types of fire doors except tin-clad doors. Sheet steel channel frames not less in thickness than No. 16 gage may be used for all types of fire doors except tin-clad doors, provided that the size of opening shall not exceed four feet by seven feet, six inches for single doors or five feet by seven feet, six inches for pairs of doors.

Frames shall be securely fastened together at the upper

corners and shall be securely anchored to the wall or partition and to the floor.

Heads and jambs shall be provided with metal door stops projecting at least $\frac{3}{4}$ -inch when used in fire assemblies having a three-hour fire-resistive rating and shall project at least $\frac{5}{8}$ -inch when used in other fire assemblies.

Where sliding fire doors are used, the frames shall be incombustible, but need not comply with the preceding provisions of this Subsection.

Astragals will be required on all double leaf doors, except that when used in openings in vertical shaft enclosures, in corridor and room partitions, or in one-hour fire-resistive separations, double leaf doors may be constructed without astragals, provided the edges of such doors which do not close against a jamb are edged with steel of not less than No. 18 gage.

EXCEPTION: Kalamein frames may be used for fire doors in openings in corridor and room partitions, in one-hour fire-resistive separations and in exterior walls where the size of the openings does not exceed three feet, six inches by seven feet, six inches.

(j) **Tin-Clad Doors.** If constructed as specified in "Tin-Clad Fire Doors", U.L.10(a), tin-clad doors installed on each side of openings requiring protection shall be considered as providing a fire assembly having a three-hour fire-protection rating, provided each door bears the label of an approved testing agency, showing the classification thereof.

DIVISION 44 — CONSTRUCTION SAFETY AND SANITARY PROVISIONS

SEC. 91.4401 — PROTECTION FENCE

(a) **Protection Fence Required.** A protection fence shall be provided where the exterior of any building or a sign on any building is erected, altered, repaired, or demolished adjacent to any public way.

EXCEPTIONS: If a barrier approved by the Superintendent of Building is provided, a protection fence will not be required in the following cases:

1. *Alleys. Where the public way has no space set aside for the use of pedestrians;*

2. *Height above public way. Where the work does not extend more than eight feet above the surface of the public way;*

3. *Distance from public way. Where the distance from the work to the public way is more than $\frac{1}{2}$ the height of construction;*

4. *Signs. Where a sign is attached to the exterior wall or roof of a building.*

5. *Parapet Alteration. Where only corrective parapet work is being conducted on a building not over 45 feet in height, provided the protection canopy is placed directly against the wall of the building and a minimum three foot high solid protective wall is placed above the canopy deck on the side away from the building.*

(b) **Dimensions.** Every protection fence shall be at least eight feet high and shall be continuous along that portion of the wall where work is in progress except that openings, as approved by the Superintendent of Building, may be provided for driveways. The protection fence shall return at each end to the inner edge of the sidewalk, and shall be located not less than four feet from the face of the wall.

(c) **Construction.** Every protection fence shall be of solid construction either of boards not less than $\frac{3}{4}$ -inch thick or plywood not less than $\frac{1}{2}$ -inch thick. All fences shall be provided with a two-inch by four-inch plate top and bottom, and shall be well braced. Plywood fences shall conform to the following requirements: 1. Plywood $\frac{1}{4}$ inch or $\frac{5}{16}$ inch in thickness shall have studs spaced not more than two feet on center.

2. Plywood $\frac{3}{8}$ inch or $\frac{1}{2}$ inch in thickness shall have studs spaced not more than four feet on center, provided a two-inch by four-inch stiffener is placed horizontally at the mid-height when the stud spacing exceeds two feet on center.

3. $\frac{3}{8}$ -inch or thicker plywood shall not span over eight feet.

(d) **Walkway Required.** Where a protection fence is erected on a public sidewalk, a pedestrian walkway shall be provided. The walkway shall be $\frac{1}{2}$ as wide as the sidewalk but shall be not less than three feet wide and need not be more than six feet wide. The required width of the walkway shall be unobstructed.

SEC. 91.4402 — PROTECTION CANOPY

(a) **Canopy Required.** In addition to a protection fence, a heavy duty protection canopy shall be provided when the work

of erecting, altering, repairing or demolishing any portion of the exterior wall of any building is being carried on at a height of more than four times the distance between the exterior wall and the protection fence.

EXCEPTIONS: 1. *A protection canopy shall not be required where a protection fence is not required by the provisions of Section 91.4401 (a).*

2. *A light duty construction canopy shall be used for building maintenance operations, including such operation as liquid washing, sandblasting, and for such minor alteration as scaffold erection, fire escape erection and water-proof pointing of masonry joints; outside of Fire District No. 1, and where the sidewalk is roped or otherwise barricaded to preclude pedestrian travel, a light duty construction canopy need be erected only over main entrances.*

(b) **Clearance.** Every protection canopy shall have a minimum headroom clearance of not less than eight feet except that bracing may encroach upon the headroom to within seven feet of the walkway.

(c) **Construction of Canopies.** 1. **Heavy duty construction canopy.** Every heavy duty construction canopy shall be capable of supporting a live load of 150 pounds per square foot and shall be capable of resisting a horizontal force equal to five pounds per square foot of deck area and applied in any direction. Every canopy shall be provided with continuous sills, curbs, and railings as required in the alternate in Items a, g and h.

Alternate: Any protection canopy may be constructed as follows:

a. Footings shall be continuous two-inch by six-inch members with scabbled joints;

b. Posts, not less than four inches by six inches in size, and spaced not more than 12 feet, center to center, shall be provided on both sides of the canopy;

c. Stringers, not less than four inches by 12 inches in size, shall be placed on edge upon the posts;

d. Joists resting upon the stringers shall be at least two inches by eight inches in size and shall be not more than two feet, center to center;

e. The deck shall be of planks at least two inches thick and nailed to the joists;

f. Each post shall be knee-braced to joists and stringers by members four feet long, not less than two inches by four inches in size;

g. A curb not less than two inches by 12 inches in size shall be set on edge along the outside edge of the deck;

h. If the space under the canopy is used to protect pedestrians there shall be a railing at least two inches by four inches in size and three feet high along the street side;

i. If the deck of any canopy designed in accordance with this alternate is used for storage, it shall be reinforced to provide for any loads in excess of 150 pounds per square foot.

2. **Light duty construction canopy.** Light duty canopies shall be supported in such manner as to sustain an assumed live load of 20 pounds per square foot. All such canopies, for protection where liquids are used, shall be covered with canvas tarpaulins or heavy building paper.

A complete enclosure by canvas or equal waterproof material

shall be provided around scaffolding or swinging stages where sandblasting, liquid washing or similar operations are performed.

(d) **Walkway Required.** The outer edge of the walkway shall be provided with a continuous handrail not less than three feet in height above the passageway grade. Portions of the public walkway not covered by such protection canopy and construction driveway shall be barricaded at each end to prevent their use by pedestrians.

(e) **Width.** The width of the protection canopy shall be not less than that required for the required walkway.

(f) **Public Works Permit.** Nothing contained in this Section shall be construed to grant permission to place a canopy over any street or public place without first obtaining the necessary permits from the Department of Public Works.

(g) **Location of Canopy.** The inner edge of the canopy shall be contiguous to the building line or to the protection fence. The outer edge shall extend to within 18 inches of the face of the curb.

SEC. 91.4403 — MAINTENANCE OF PROTECTION FENCES AND CANOPIES

(a) **Removal.** Every protection fence or canopy on any public property shall be removed within 30 days after such protection is no longer required by this Division.

(b) **Temporary Walkway.** Unless the sidewalk is maintained in its original condition for the use of pedestrians, every protection fence and canopy shall be provided with a temporary plank walkway at least two inches in thickness and not more than 12 inches above the sidewalk beneath. The necessary steps at each end shall have risers of not more than six inches, or a ramp may be used.

(c) **Obstructions.** Every temporary walkway shall be kept free from obstructions.

On the side adjacent to pedestrian walkways, surfaces of protection fences and canopies shall not hold any projecting nails, splinters, metal fragment or any similar sharp or serrated object.

(d) **Fire Protection.** Protection fences and canopies shall not be constructed in such a way as to interfere with any fire escape or any fire-fighting equipment.

SEC. 91.4404 — PERMANENT GUARDRAILS

(a) **Guardrails Required.** Where a floor, roof, or deck is accessible from a stairway or doorway and the floor, roof or deck is more than 30 inches above the adjoining ground or floor level, a protective guardrail shall be provided in such a manner as to separate completely the doorway from the edge of the floor, roof or deck and also enclose all traffic lanes and all equipment requiring periodic servicing.

(b) **Guardrail Details.** Guardrails shall be 36 inches minimum height. Places of employment, except for household domestic services, shall provide protection by 42 inch minimum height guardrails.

EXCEPTIONS: 1. Galleries, balconies, or other elevated locations where seats are arranged on platforms or successive tiers may have the rail along the front edge not less than 30 inches high.

2. On roofs of existing buildings, 24-inch high parapet walls may be used in lieu of a required guardrail.

Open guardrails shall have intermediate rails spaced not more than 9 inches vertically or horizontally or have an ornamental pattern which provides equivalent security. Industrial uses may have intermediate rails spaced not more than one-half the rail height with a maximum of 21 inches.

SEC. 91.4405 — DEMOLITION

The work of demolishing any building shall conform to the following regulations: (a) **Handling of Materials.** All materials shall be handled within the building area or within an area bounded by a barricade approved by the Superintendent of Building.

(b) **Structural Members.** No structural member in any story shall be demolished or removed until the story next above is completely removed.

EXCEPTION: The requirements of this subsection shall not apply where the method of demolition used and the plan of operation is such that all stories of the building collapse at one time, and such method and plan of operation are approved by the Department, as complying with the intent of this Section.

(c) **Storage of Materials.** No material shall be stored on any floor in excess of the allowable live load for that floor.

(d) **Prevention of Dust.** All debris shall be sufficiently wet at the time of handling to prevent dust from arising.

(e) **Hazardous Conditions.** Whenever there is evidence of probable danger to life, limb, or adjacent property, the Superintendent of Building may require the permittee to submit a scheme of operation and no further work shall be done until such statement or plan is approved by the Superintendent of Building.

SEE RULE OF GENERAL APPLICATION #1-73 IN APPENDIX SECTION

SEC. 91.4406 — TOILET FACILITIES DURING CONSTRUCTION

(a) **Toilet Facilities Required.** No person shall commence or proceed with the erection, construction, alteration, repair, raising, adding to, removal or demolition of any building or structures, unless adequate, suitable, sanitary toilet facilities under the control of such person are provided for the use of any person employed or working upon such building or structure. Such toilet facilities shall be located upon or within a reasonable distance of the lot, premises, or site upon which such work is being done. In no case shall the line of travel to any toilet facility exceed 500 feet.

(b) **Toilet Standards.** Every toilet shall be of the waterflush type and connected to a public sewer or a private sewage disposal system built in accordance with the provisions of the Plumbing Code. All toilet structures shall be completely enclosed on four sides and the top, and the door shall be self-closing; the toilet floor shall be smooth, and screened ventilation shall be provided for the toilet compartment. Where workmen are employed during the night hours, the toilet building shall be provided with artificial light. In lieu of flush water closets, approved chemical toilets which meet the requirements of Ordinance No. 127,507 may be provided.

SEC. 91.4407 — SWIMMING POOLS — PROTECTIVE DEVICES REQUIRED

(a) Fences. Every swimming pool, fish pond or other body of water which contains water 18 inches or more in depth shall be enclosed by a fence, the height of which, including gates, shall be not less than four and one-half feet above the ground. Gates shall be self-latching with the latch located four and one-half feet minimum above the ground.

Where the ground surface on the side of the fence away from the body of water slopes upward, four and one-half feet clearance shall be maintained between the fence and the face of the slope.

In lieu of maintaining a fence, the owner may provide a competent person who shall keep the pool under observation at all times while water is kept in the pool.

EXCEPTION: The provisions of this section shall not apply to oceans, lakes, rivers, streams and similar bodies of water, which are publicly owned over which the State of California or the City or County of Los Angeles has control and jurisdiction.

(b) Time for Compliance. All persons maintaining such pools shall comply with the provisions of this Section within 90 days after the effective date of this Section.

(c) Modifications. Individual appeals for slight modification of the requirements of this section shall comply with the provisions of Section 98.0403 of the Los Angeles Municipal Code.

SEC. 91.4408 — SHAFTS, PITS AND SIMILAR EXCAVATION — MISDEMEANOR

Every person owning or having charge of land upon which is located any active or abandoned mining shaft, test hole, well, pit or similar excavation which exceeds six inches in any lateral dimension and three feet in depth shall cover, fence securely or provide some equivalent protection for the hazard and keep it so protected. Failure to do so shall cause such person to be guilty of a misdemeanor.

DIVISION 45 — PROJECTIONS FROM BUILDINGS

SEC. 91.4501 — GENERAL

(a) **Scope.** The provisions of this Division shall apply to all projections extending beyond the exterior wall of any building.

(b) **Setback and Yard Requirements.** The provisions of this Division shall not be construed to permit any projection or construction prohibited by any law or ordinance regulating setbacks or yards.

(c) **Signs.** Any architectural projection which extends beyond the building line more than the amount exhibited in Table No. 45-A shall be classed as a sign. Such projection shall be detachable from the supporting building and details of the attaching device shall be submitted for approval to the Department of Building and Safety.

(d) **Definitions.** For the purpose of this Division, certain terms are defined as follows:

Architectural Projection shall mean any projection not intended for shelter or occupancy and which extends beyond the outer face of an exterior wall of a building, but shall not include signs.

Awning shall mean a temporary shelter supported by an exterior wall of a building and of a type which can be retracted, folded or collapsed against the face of the supporting building.

Bay Window shall mean a windowed enclosure projecting outward beyond the exterior wall of a building.

Canopy shall mean a fixed shelter used only as a roof and attached to the exterior wall or walls of the building and not projecting beyond the building line and used only for purposes accessory to the building to which it is attached. Canopies may have column supports in addition to the support provided by the building to which they are attached.

Exterior Balcony shall mean an unroofed cantilevered platform projecting from the exterior wall of a building. A cover created by a similar balcony or an eave projection not exceeding four feet shall not be considered as a roof for the purpose of this Code.

Fire Escape shall mean an emergency exit composed of landings and stairs attached to the exterior wall of a building.

Marquee shall mean a fixed shelter used only as a roof and extending over a building line and which is entirely supported by the building to which it is attached.

(e) **Height Above Roadway.** No portion of any projection from any building shall be allowed over any roadway below an elevation 14 feet above the roadway surface.

SEC. 91.4502 — ARCHITECTURAL PROJECTIONS

(a) **Building Area.** The building area of every building shall include all portions of architectural projections.

EXCEPTION: Any architectural projection which is entirely separated from the supporting building by an exterior wall and which is not wider than four feet need not be included in the building area.

(b) **Projection Beyond Building Line.** No architectural projec-

tion shall extend beyond a building line or into an exit court more than the amounts exhibited in Table No. 45-A.

TABLE NO. 45-A—PROJECTION BEYOND BUILDING

Height Above Ground or Pavement	Maximum Distance Beyond Building Line
Below 8'	3"
8' to 10'	12"
Over 10' to 12'	24"
Over 12'	30"

TABLE NO. 45-B—AREA LIMITATIONS FOR PROJECTIONS

Projection Beyond Building Line	% of Gross Area of Exterior Wall to Which Attached*
Less than 12"	No Limitations
12" to 18"	20%
Over 18" to 24"	15%
Over 24" to 30"	5%

*The total area of all projections extending 12" or more beyond the building line may not exceed 20% of the gross area of the exterior wall to which they are attached.

(c) **Construction of Architectural Projections.** Every architectural projection shall be of the same period of fire resistance as that required for the exterior walls to which it is attached, or it may be constructed of incombustible materials.

EXCEPTION: If entirely separated from the interior of the building by exterior walls, an architectural projection may be of wood not less than 1½" in thickness, provided that portion of said architectural projection exceeding 12' above grade shall not cover an area exceeding 10 percent of that portion of the exterior wall extending above 12'.

(d) **Height.** No portion of an architectural projection shall extend to an elevation more than 20 feet higher than the roof adjacent thereto.

(e) **Area.** The total area of all architectural projections and signs which project beyond the building line shall not exceed those limitations shown in Table No. 45-B.

SEC. 91.4503 — AWNINGS

(a) **Allowable Projection.** An awning shall not project more than seven feet from the face of an exterior wall. No portion of an awning shall extend nearer to the face of the curb than one foot measured in a horizontal direction.

(b) **Height.** All portions of any awning shall be at least eight feet above any public walkway.

EXCEPTIONS: 1. Any valance attached to an awning shall be of cloth unless it is fabricated of the same material used for the roof of the awning. A metal valance may have a reinforcing member at or near the lower edge. The valance shall not project above the roof of the awning at the point of attachment and shall not extend more than 12 inches below the roof of the awning at the point of attachment; nor shall any portion of a valance be less than seven feet in height above a public way.

2. Boxed ends shall not extend above the roof of the awn-

ing. Valances may be attached to boxed ends with the maximum height of 12 inches below the leading or outer edge of the awning.

3. Operating equipment must be so designed and constructed that the awning may be retracted, folded or collapsed against the face of the exterior walls without the use of scaffolding or ladders and such equipment shall not project more than six inches beyond the exterior wall of the building when installed below a height of eight feet.

(c) **Construction.** Awnings may be constructed of cloth, corrosive-resistant metal, or approved plastics.

Awnings which project into any portion of a site used for the servicing of motor vehicles shall be of incombustible materials.

Awnings constructed of cloth shall be designed to support twice their own weight. Front boards and back boards may be constructed of wood.

Awnings constructed of corrosive-resistant metal or approved plastics shall have the roof and frame designed and constructed so as to support a gravity live load of five pounds per square foot and a wind load of five pounds per square foot acting vertically against the underside of the awning.

The length of a single section of collapsible type awning shall not exceed 20 lineal feet. Every awning roof shall slope from the building on one plane and shall have a maximum pitch of 60 degrees with the horizontal.

EXCEPTION: The pitch with the horizontal may be increased to exceed 60 degrees if the vertical height of the awning does not exceed the height of the building or 14 feet, whichever is less.

Every awning shall be collapsible, retractable, or capable of being folded against the face of the supporting building.

EXCEPTION: A fixed awning not more than 10 feet in length may be erected over a doorway to the building.

(d) **Location.** Awnings erected on buildings more than 14 feet above street level shall be placed over exterior wall openings only.

(e) **Signs.** No sign, lettering or advertising delineation shall be placed on any portion of an awning except the valance. Detachable signs shall be considered a part of and comply with the requirements of a valance. Awnings above a height of 14 feet shall have no sign, lettering, or advertising delineation.

(f) **Fire Escape Clearance.** Where awnings are placed under a fire escape equipped with a drop ladder, provision shall be made for a 24 inch by 24 inch opening through the awning at the top ladder location. This opening may be closed temporarily by a snap-on canvas cover. Any covering for an opening in a metal awning shall be an approved design.

(g) **Maintenance.** All new awnings shall be installed and maintained in accordance with the provisions of this Section and all existing awnings shall be made to comply with said provisions.

All awnings shall be maintained in a structurally safe condition, and the appearance of the awning shall be such that it will not be detrimental to surrounding property.

(h) **Identification.** Every awning installation shall bear an identifying tag giving the name and address of the manufacturer.

SEC. 91.4504 — EXTERIOR BALCONIES

(a) Projections from Exterior Walls. No exterior balcony shall project more than four feet beyond the exterior walls of a building. No exterior balcony shall project over public property.

EXCEPTION: An exterior balcony serving Groups R or H Occupancies may project five feet beyond the exterior wall of a Type V building.

(b) Construction. 1. The floor of every exterior balcony shall be constructed as required for second floor construction of the building to which the balcony is attached, but shall not be of less than one-hour fire-resistive construction when the exterior wall requires a fire-resistive time period.

EXCEPTION: Exterior balconies which require one-hour fire-resistive construction may be constructed with a surface of one inch incombustible material in lieu of a finish layer of tongue and groove flooring or ¾-inch plywood.

2. Exterior balcony railings shall be composed of incombustible materials or of the same materials as required for the exterior walls of the building.

EXCEPTION: Type V buildings may have balcony rails of wood not less than 1½ inches in thickness.

SEC. 91.4505 — BAY WINDOWS

(a) Projection. No bay window shall extend beyond the building line.

(b) Construction. The construction of every bay window shall be of the same type of construction and fire-resistive rating as required for the walls and roof of the building to which it is attached.

SEC. 91.4506 — CANOPIES

(a) Projection from Exterior Walls. A canopy may project not more than 16 feet from the face of an exterior wall of a building, but no portion of any canopy shall project beyond the building line, nor into any portion of the site where fire-protection assemblies are required for openings in exterior walls.

EXCEPTION: A canopy may project into an area where openings are required to be fire-protected, if all openings sheltered by such canopy are provided with the required fire-protection assemblies.

The building area shall include the area under all canopies.

(b) Repealed.

(c) Construction. Every canopy shall be composed of incombustible materials.

EXCEPTION: If located between a public way and an entrance to a building and if used only for pedestrian protection, one canopy not more than 12 feet wide, measured in a direction parallel to the face of the building and not more than 30 feet in length, may be covered with canvas or approved plastic material as provided in Division 61 with an average extent of burning, as defined in ASTM D-635-72, of not more than one inch. Canvas shall be treated with flame retardant as approved by the Fire Department.

SEC. 91.4507 — FIRE ESCAPES

(a) Projection from Exterior Walls. A fire escape may project not more than four feet beyond the building line.

(b) **Height and Clearance.** No portion of a fire escape shall be less than 14 feet above any sidewalk or roadway.

SEC. 91.4508 — EXTERIOR STAIRWAYS

(a) **Projection from Exterior Walls.** An exterior stairway may project beyond the exterior wall of a building but shall not project beyond the building line.

(b) **Construction.** Exterior stairways shall be constructed as specified in Division 33 (Exits).

SEC. 91.4509 — MARQUEES

(a) **Approval of Plans and Specifications.** The plans and specifications and the type, design, arrangement, and location of every marquee shall be approved by the Board of Municipal Art Commissioners of the City of Los Angeles prior to the issuance of a building permit.

(b) **Projection from Exterior Walls.** The projection of a marquee beyond the exterior wall of any building shall not exceed 12 feet nor $\frac{1}{4}$ of the distance from the building line to the face of the curb. No portion of any marquee shall extend over any roadway, nor be nearer to the face of the curb than three feet, measured in a horizontal direction.

(c) **Height and Clearance.** The lowest portion of every marquee shall be not less than eight feet nor more than 20 feet above the pavement beneath.

(d) **Construction.** Every marquee shall be constructed of incombustible materials.

EXCEPTION: A marquee may be covered with any of the fire-retardant roof coverings specified in Division 38 (Roof Construction and Covering).

(e) **Drainage.** The roof of every marquee shall be drained. Vertical conductors used for roof drainage may project not more than six inches beyond the exterior wall of the building.

(f) **Dimensions.** The total vertical height of every marquee or canopy at every point or portion thereof, including the border or outer boundary thereof, measured from the level or elevation of the lowest to highest portion thereof shall not exceed the following heights, based upon the length of the marquee or canopy measured parallel with the front of the building to which it is attached, to wit:

Length of Marquees

Vertical Height

Less than 10 ft.....	4 feet
10 to 20 ft. inclusive.....	6 feet
Over 20 ft.....	9 feet

Provided, however, that ornamentations may be constructed on top of and as a part of a border at the outer boundary of a marquee or canopy, provided the total length of all such ornamentations does not exceed 20% of the length of the front, side and ends of such marquee or canopy and, provided no portion or any such ornamentation is more than three feet above the highest level or elevation permitted by the foregoing table. Any attached sign shall be considered a portion of the marquee.

(g) **Signs.** Signs shall not be attached to any portion of the marquee except the periphery. Cloth or banner signs, or drop-roll curtains may be suspended below the exterior periphery and extend within seven feet of the grade.

SEC. 91.4510 — MISCELLANEOUS PROJECTIONS

(a) **Fire Department Connections.** Fire department connections to standpipes and sprinkler systems may project six inches beyond the building line at any elevation.

(b) **Projections under Sidewalk.** No footing or other structure shall extend into a public way unless authorized by permit from the Board of Public Works.

(c) **Window Projection.** Windows in an open position may project over a public way 36 inches if over 14 feet above the adjacent grade.

DIVISION 47 — LATHING, PLASTERING AND INSTALLATION OF WALLBOARD

SEC. 91.4701 — SCOPE

(a) **General.** Lathing, plastering and the installation of gypsum wallboard shall be done in the manner and with the materials specified in this Division, and when required for fire protection shall comply with the provisions of Division 43 of this Article.

(b) **Inspection.** No plaster shall be applied until the lathing has been inspected and approved by the Superintendent of Building.

(c) **Tests.** Whenever there is evidence that any required lathing or plastering does not conform to the requirements of this Division, samples of the work shall be taken and sufficient physical and chemical tests shall be made by an approved testing agency to establish conformity or lack of conformity.

Tests of materials shall be made in conformity with the A.S.T.M. Specifications noted for the specific material.

All testing and replacement shall be done without expense to the City.

SEC. 91.4702 — MATERIALS

Materials shall conform to the following standards:

Sand. Sand for use in plaster shall be washed and shall conform to Specifications for Inorganic Aggregates for Use in Interior Plaster. The term "washed" as used herein shall be defined as the complete inundation of the native sand in circulating fresh water, such water to be in sufficient quantity that when the sand is agitated, the clays and excess fines escape in the wash water overflow system. When used with portland cement for scratch-coat plastering the amount of sand retained on a No. 8 sieve shall be not less than 10% or more than 30%. A.S.T.M. Designation C35.

Perlite. All perlite containers shall be marked indicating that the perlite contained therein conforms to A.S.T.M. Designation C35.

Vermiculite. All vermiculite containers shall be marked indicating that the vermiculite contained therein conforms to A.S.T.M. Designation C35.

Gypsum Plaster. A.S.T.M. Designation C28.

Lime. Special Finishing Hydrated Lime (auto-claved) A.S.T.M. Designation C208.

Quicklime for structural purposes. (Lime putty shall be made from quicklime or hydrated lime and shall be prepared in an approved manner.) A.S.T.M. Designation C5.

Keene's Cement. A.S.T.M. Designation C61.

Portland Cement Type I, II, or III. A.S.T.M. Designation C150.

Type I-A, II-A, or III-A air-entraining portland cement. Approved types of plasticizing agents may be added to Portland Cement Types I or II in the manufacturing process, but not in excess of 12% of the total volume. Plastic or waterproofed cements so manufactured shall meet the requirements for portland cement as set forth in A.S.T.M. Designation C150 except in respect to the limitations on insoluble residue, air-entrain-

ment, and additions subsequent to calcination. A.S.T.M. Designation C175.

Gypsum Lath. A.S.T.M. Designation C37.

Metal Lath and Metal Accessories and Channels. A.S.A. A42.4.

Wire Fabric Lath. Wire fabric lath for interior plastering on solid backing shall be not lighter than No. 16 gage, welded, zinc-coated wire with openings not larger than two inches by two inches or not lighter than 1 inch x 20 gage zinc-coated woven wire fabric lath. Lath shall be self-furring or may be flat for use with furring nails.

Wire fabric lath for exterior plastering shall be welded or woven steel wire zinc-coated unless fabricated from zinc-coated wire with openings not larger than one inch for No. 18 gauge wire, 1½ inches for No. 17 gauge wire and two inches for No. 16 gauge wire.

Wire fabric lath paperbacked shall be not lighter than No. 16 gage welded, zinc-coated wire with openings not larger than two inches with attached paperbacking perforated or woven wire lath zinc-coated with openings not larger than one inch for No. 18 gauge wire or one and one-half inch for No. 17 gauge wire. Lath shall be self-furring or may be flat for use with furring nails. Paperbacking shall be waterproof unperforated for exterior plastering.

Gypsum Wallboard. Gypsum wallboard shall be not less than ½-inch in thickness. A.S.T.M. Designation C-36.

SEC. 91.4703 — INTERIOR PLASTERING — LATHING

For gypsum laths, the distance between supports shall conform to the requirements set forth in Table No. 47-A.

Plain gypsum lath may be used where one-hour, fire-resistance is not required.

Perforated gypsum lath used on horizontal wood supports in one-hour, fire-resistive construction shall have all joints covered with a strip of metal lath, or wire fabric lath not less than three inches wide when plastered with sanded gypsum plaster. Such stripping of joints is not required when perlite or vermiculite gypsum plaster is used.

Approved Type "X" gypsum lath (special fire retardant) may be used in fire-resistive construction as specifically described in Table No. 43.

The weight of metal lath or wire fabric lath and the spacing of supports shall conform to the requirements set forth in Table No. 47-B. Attachment to supports shall be as set forth in Table No. 47-A.

Corner reinforcement shall be provided at all interior angles except where metal lath, wire lath or wire fabric lath is carried around such intersections. Corner reinforcement shall consist of flat or shaped reinforcing units of metal which when shaped for angle reinforcing shall have minimum outstanding legs of two inches and shall weigh not less than 1-7/10 pounds per square yard.

No interior lath shall be applied until all exterior framing is covered.

Every plastered horizontal or sloping surface on which the plaster is more than one inch thick, measured to the outer face of the lath, shall be provided with additional lath which shall be not less than ¼ inch nor more than ¾ inch from the face of the plaster. When used to provide a required time period of

**TABLE NO. 47-A — TYPE OF LATH—MAXIMUM
SPACING OF SUPPORTS—METHOD
OF ATTACHMENT**

TYPE OF LATH	MAXIMUM SPACING OF WOOD SUPPORTS (Inches)		SIZE AND TYPE OF NAIL	SPACING OF NAILS (Inches)	MAXIMUM SPACING OF METAL SUPPORTS (Inches)	
	Vert. Surfaces	Horiz. Surfaces			Vert. Surfaces	Horiz. Surfaces
$\frac{3}{8}$ " perforated gypsum lath ¹	16	16	$\frac{1}{4}$ " No. 13 gauge 19/64" diameter head blued nail	5	16	16 ³
$\frac{3}{8}$ " plain gypsum lath ¹	16	16	$\frac{1}{4}$ " No. 13 gauge 19/64" diameter head blued nail	5	16	16
$\frac{1}{2}$ " perforated gypsum lath ¹	16	16	$\frac{1}{4}$ " No. 13 gauge 19/64" diameter head blued nail	5	16	16
$\frac{1}{2}$ " plain gypsum lath ¹	24	24	$\frac{1}{4}$ " No. 13 gauge 19/64" diameter head blued nail	5	24	24
Metal lath, and wire fabric lath ²	See Table No. 47-B		4d blued box nails (bent over)	6	See Table No. 47-B	
Metal lath, and wire fabric lath ²	See Table No. 47-B		$\frac{1}{4}$ " No. 11 gauge 7/16" diameter head barbed nails	6	See Table No. 47-B	

NOTES:

¹Gypsum lath shall be applied to wood supports with joints broken in each course except that end joints may fall on one support when stripped with three inches of metal lath or wire fabric lath. Vertical joints on walls and joints on ceilings shall be staggered. Lath shall be butted together. Joints exceeding three-eighths inch shall be covered with a strip of metal lath or wire fabric lath not less than three inches wide. Lath shall be secured to horizontal or vertical metal supports by means of approved clips or other equivalent approved attachment and to wood supports by approved attachments. In addition to clips at corners a clip is required at mid-point at ends of gypsum lath on ceilings.

²Diamond mesh, metal lath and wire fabric lath shall be lapped at least one mesh at sides, but need not exceed one inch. Rib metal lath with edge ribs greater than $\frac{1}{4}$ inch in depth shall be lapped at sides by nesting outside ribs. Rib metal lath with edge ribs no greater than $\frac{1}{4}$ inch in depth shall be either lapped at least $\frac{1}{2}$ inch at sides or nested on the outside ribs. Lath shall be lapped at least one mesh at ends, but need not exceed one inch. Lath shall be attached to horizontal and vertical metal supports so as not to exceed 6-inch spacing with not less than No. 18 U. S. steel wire gage, galvanized and annealed wire, or an equivalent approved attachment.

³Sixteen-inch spacing for clips giving continuous support to lath.

fire resistance the additional lath shall be not less than $\frac{1}{2}$ inch from the face of the plaster.

The additional lath shall be attached to the supporting framework as required for suspended ceilings.

RULE OF GENERAL APPLICATION #7-68 APPLIES. SEE APPENDIX LISTING.

**SEC. 91.4704 — INTERIOR PLASTERING — LATH AND
PLASTERING PARTITIONS**

(a) **Hollow Partitions.** Hollow partitions of lath and plaster shall have a shell thickness of not less than $\frac{3}{4}$ inch.

TABLE NO. 47-B — TYPES AND WEIGHTS OF METAL LATH, WIRE LATH, AND WIRE FABRIC, AND SPACING CENTER TO CENTER OF SUPPORTS¹

TYPE OF LATH	MINIMUM WEIGHT OF LATH (pounds per Square Yard)	MAXIMUM ALLOWABLE SPACING OF SUPPORTS (Inches)				
		VERTICAL SUPPORTS			HORIZONTAL SUPPORTS	
		Wood	METAL		Wood or Concrete	Metal
			Solid partitions	Others		
Diamond mesh (flat expanded) metal lath	2.5	18	16	12	12	12
	3.4	18	16	16	16	16
Flat rib expanded metal lath	2.75	16	16	16	16	16
	3.4	19	24	19	19	19
¾" rib expanded metal lath ²	3.4	24	----	24	24	24
	4.0	24	----	24	24	24
Sheet metal lath	4.5	24	----	24	24	24
Wire Fabric Lath ³	See Section 91.4702	16	0	16	16	16

NOTES:

¹Lath may be used on any spacing, center to center, up to the maximum shown for each type and weight.

²Rod-stiffened or V-stiffened diamond mesh (flat expanded) metal lath of equal rigidity and weight is permissible on the same spacing as ¾-inch rib metal lath.

³High absorbent paper backed Wire Fabric Lath may be used on horizontal supports spaced not more than 24 inches o.c.

(b) **Solid Partitions With Studs.** The minimum thickness of solid partitions of lath and plaster with studs shall be not less than two inches or 1/84 of the distance between supports.

(c) **Studless Solid Partitions.** Studless solid partitions of metal lath and plaster or gypsum lath and plaster shall be not more than 10 feet in height.

SEC. 91.4705 — INTERIOR—SUSPENDED AND FURRED CEILINGS

The main runners and cross furring shall be not less than the sizes set forth in Table No. 47-C, except that other shapes of hot-rolled or cold-rolled members of equal strength may be substituted for those prescribed in the table.

Hangers for suspended ceilings shall be not less than the sizes set forth in Table No. 47-C, fastened to or embedded in the structural framing, masonry, or concrete.

Hangers shall be saddle-tied, or wrapped around main runners so as to develop the full strength of the hangers. Lower ends of flat hangers shall be bolted with ¾ inch bolts to runner chan-

nels, or bent tightly around runners and bolted to the main part of the hanger.

Cross furring shall be securely attached to main runners by one of the following:

1. Saddle tying with No. 16 U. S. steel wire gage galvanized wire; or
2. Approved special clip; or
3. An approved equivalent attachment.

RULE OF GENERAL APPLICATION #4-74 APPLIES. SEE APPENDIX LISTING

SEC. 91.4706 — INTERIOR PLASTERING — NUMBER OF COATS AND THICKNESS

(a) Number of Coats. Plastering with gypsum, portland cement or portland cement-lime plaster shall be three-coat work when applied over metal lath or wire fabric lath, and shall be not less than two-coat work when applied over other plaster bases allowed in this Division.

Gypsum plaster may be used upon any type of base for fire-resistive structural purposes, but shall not be used for exterior plaster.

Masonry surfaces to which plaster is to be applied shall be sufficiently rough to provide a mechanical key for the plaster and shall be clean and free from paint, oil and any loose or scaly substance ready for plastering.

Portland cement plaster or portland cement-lime plaster may be used for any purpose in any location but shall not be applied over gypsum lath, gypsum masonry or gypsum plaster.

(b) Thickness. The thickness of plaster shall be as set forth in Table No. 47-D.

If monolithic concrete ceiling surfaces require more than $\frac{3}{8}$ inch of plaster to produce desired lines or surfaces, metal lath or wire fabric lath shall be attached thereto.

SEC. 91.4707 — INTERIOR PLASTERING — PROPORTIONING AND MIXING

(a) Base Coats. 1. Gypsum or hardwall plaster. The proportion of sand, vermiculite, or perlite to 100 pounds of gypsum neat plaster shall not exceed the values set forth in Table No. 47-E.

2. Wood-fiber gypsum plaster. Where applied on masonry, mix in proportions of 100 pounds of plaster to not more than 100 pounds of sand.

EXCEPTION: Wood-fiber gypsum plaster may be mixed in proportions of 100 pounds of plaster to not more than 100 pounds of sand, where not more than one-hour fire resistance is required.

4. Portland cement plaster. The first two coats shall be as required for the first two coats of exterior work.

SEC. 91.4708 — INTERIOR PLASTERING — APPLICATION OF PLASTER

(a) Base Coats. 1. Gypsum plaster. The scratch coat shall be applied with sufficient material and pressure to form a full key or bond.

For two-coat work plaster shall be doubled back, drawn out

to grounds and straightened to a true surface and left rough to receive the finish coat. For three-coat work, the surface shall be scratched to provide a bond for the brown coat and shall have been in place at least 12 hours before the second or brown coat is applied. The second or brown coat shall be drawn out to grounds, and straightened to a true surface and left rough, ready to receive the finish coat.

3. **Portland cement plaster.** The first two coats shall be as required for the first two coats of exterior work.

(b) **Finish Coats for Gypsum, Portland Cement and Portland Cement-Lime Plaster.** The finish coats shall be mixed, proportioned, and applied in an approved manner.

(c) **Plaster on Monolithic Concrete.** Monolithic concrete surfaces shall be clean, free from efflorescence and covered by a dash coat of portland cement grout composed of one part of portland cement to one and one-half parts of fine sand. This coat shall be kept moist for not less than 48 hours and to insure suction there shall be a surface drying period after the moist curing period.

Surfaces of ceilings shall have a coat of bond plaster, scratched in thoroughly, doubled back and straightened to a true even surface and left rough ready to receive the finish coat.

Surfaces of walls and columns shall have a scratch coat of bond plaster, followed by a brown coat of gypsum plaster troweled into the scratch coat before it has set or the brown coat may be applied directly to the portland cement dash coat. The brown coat shall be mixed in the proportions of one part gypsum neat plaster to not more than three parts of sand by weight, or 100 pounds of gypsum neat plaster to not more than three cubic feet of vermiculite or perlite. The brown coat shall be brought out to grounds, straightened to a true even surface and left rough, ready to receive the finish coat.

Portland cement plaster applied to interior concrete walls or ceilings shall conform to requirements for application to exterior concrete walls as specified in Section 91.4712 (c).

SEC. 91.4709 — MACHINE-APPLIED PLASTER

(a) **Machines.** Machines for the placing of plaster shall be manufactured to meet the following general requirements:

1. Plaster aggregate and water shall be mixed in a plaster mixer and transferred from the mixer to a hopper, or mixed in a combination drum and hopper;

2. Plaster shall then be projected into, and conveyed through a tube to the nozzle at the end of the conveyor and deposited by air pressure in its final position.

(b) **Proportions.** 1. Gypsum or portland cement plaster. Machine-placed plaster shall consist of a mixture as required by this Division. Plasticity agents in portland cement plaster may be used as approved by the Superintendent of Building.

2. **Application.** Plaster shall be applied of the same thickness and in the same number of coats as required by this Division.

3. **Textured finishes.** All machine mixed plaster including acoustical plaster, dash plaster coats and other textured plaster finishes shall be mixed and handled by machines according to the manufacturer's specifications and as approved by the Superintendent of Building.

SEC. 91.4710 — INTERIOR PLASTERING — STAFF

Staff shall be soaked before sticking. Lugs shall be of pure fiber and plaster of Paris. Rust-resistive fastenings of sufficient strength to anchor the staff to the support shall be not less than No. 14 B. & S gauge copper wire.

SEC. 91.4711 — EXTERIOR PLASTERING

(a) **Definitions.** Exterior lathing and plastering shall be defined as all lathing and plastering applied to surfaces of walls, ceilings and roof soffits exposed to the weather except:

1. Ceiling and roof soffits enclosed by walls or by beams which extend a minimum of 12 inches below the plastered surfaces;

2. Walls, ceilings and roof soffits beyond a horizontal distance of 10 feet of any plane making a 45-degree angle with the vertical and tangent to the nearest outer edge of the ceiling or roof directly above.

(b) **Backing.** Studs shall be sheathed, or wire of not less than No. 18 U. S. steel wire gage shall be stretched taut horizontally at intervals not exceeding six inches on center vertically and securely fastened in place, as set forth in Table No. 47-I. This shall not be required with metal lath or paperbacked wire fabric.

(c) **Weather Protection.** All paper backing used to satisfy the requirements of this Division or to provide weather protection for residential occupancy as specified in Subsection 91.4813(b) shall be weather resistive building paper weighing at least 14 pounds per 108 square feet or shall comply with Federal Specification UU-B-790 for Type I, Grade B, Style II weather resistive building paper.

(d) **Metal Reinforcement.** Exterior plaster, except when applied to masonry or concrete, shall be reinforced with one of the materials as set forth in Table No. 47-B having a rust resistive coating.

Metal reinforcement shall be furred out from the backing at least $\frac{1}{4}$ inch by an approved furring method, and shall be nailed with galvanized nails or approved furring devices driven to at least $\frac{1}{4}$ -inch penetration which shall be spaced not more than six inches apart vertically and 16 inches apart horizontally. Metal reinforcement shall be lapped at least one full mesh at all joints. When no sheathing is used, all vertical joints shall be made at the studs, and horizontal joints where expanded metal or metal lath is used shall have at least one tie between studs, made with No. 18 U. S. steel wire gage galvanized annealed tie wire.

(e) **Additional Lath.** Every plastered horizontal or sloping surface on which the plaster is more than one inch thick, measured to the outer face of the lath, shall be provided with additional lath which shall be not less than $\frac{1}{4}$ inch nor more than $\frac{3}{4}$ inch from the face of the plaster. When used to provide a required time period of fire resistance the additional lath shall be not less than $\frac{1}{2}$ inch from the face of the plaster.

The additional lath shall be attached to the supporting framework as required for suspended ceilings.

TABLE NO. 47-C—SUSPENDED AND FURRED CEILINGS

Minimum Sizes for Wire and Rigid Hangers

			MAXIMUM AREA SUPPORTED	SIZE
Hangers for Suspended Ceilings			12.5 sq. ft. 16 sq. ft. 18 sq. ft. 20 sq. ft. 22.5 sq. ft. 25 sq. ft.	9 gauge wire 8 gauge wire 3/16" diameter, mild steel rod ¹ 7/32" diameter, mild steel rod ¹ 1/4" diameter, mild steel rod ¹ 1" x 3/16", mild steel flats ²
Hangers for Attaching Runners and Furring Directly to Beams and Joists	For Supporting Runners	Single Hangers Between Beams³	8 sq. ft. 12 sq. ft. 16 sq. ft.	12 gauge wire 10 gauge wire 8 gauge wire
		Double Wire Loops at Beams or Joists³	8 sq. ft. 12 sq. ft. 16 sq. ft.	14 gauge wire 12 gauge wire 11 gauge wire
	For Supporting Furring Without Runners³ (Wire Loops at Supports)	Type of Support: Concrete Steel Wood		
			8 sq. ft.	14 gauge wire
			8 sq. ft.	16 gauge wire (two loops) ⁴
			8 sq. ft.	16 gauge wire (two loops) ⁴

NOTES:

1. All rod hangers shall be protected with a zinc or cadmium coating or with a rust-inhibitive paint.
2. All flat hangers shall be protected with a zinc or cadmium coating or with a rust-inhibitive paint.
3. Inserts, special clips or other devices of equal strength may be substituted for those specified.
4. Two loops of No. 18 gauge wire may be substituted for each loop of No. 16 gauge wire for attaching steel furring to steel or wood joists.
5. These spans are based on webs of channels being erected vertically.
6. Other sections of hot- or cold-rolled members of equivalent beam strength may be substituted for those specified.

Note: All gauges are U.S. steel wire gauges.

TABLE NO. 47-C (Continued)

Minimum Sizes and Maximum Spans for Main Runners⁵⁻⁶

SIZE AND TYPE	MAXIMUM SPACING OF HANGERS OR SUPPORTS (Along Runners)	MAXIMUM SPACING OF RUNNERS (Transverse)
$\frac{3}{4}$ "—, 3 lb. per ft., cold- or hot-rolled channel	2' 0"	3' 0"
$1\frac{1}{2}$ "—, 475 lb. per ft., cold-rolled channel	3' 0"	4' 0"
$1\frac{1}{2}$ "—, 475 lb. per ft., cold-rolled channel	3' 6"	3' 6"
$1\frac{1}{2}$ "—, 475 lb. per ft., cold-rolled channel	4' 0"	3' 0"
$1\frac{1}{2}$ "—1.12 lb. per ft., hot-rolled channel	4' 0"	5' 0"
2"—, 590 lb. per ft., cold-rolled channel	5' 0"	3' 6"
2"—1.26 lb. per ft., hot-rolled channel	5' 0"	5' 0"
$1\frac{1}{2}$ " x $1\frac{1}{2}$ " x $\frac{3}{16}$ " angle	5' 0"	5' 0"

Minimum Sizes and Maximum Spans for Cross Furring⁵⁻⁶

SIZE AND TYPE	MAXIMUM SPACING OF RUNNERS OR SUPPORTS	MAXIMUM SPACING OF CROSS FURRING MEMBERS (Transverse)
$\frac{1}{4}$ " diameter pencil rods	2' 0"	12"
$\frac{3}{8}$ " diameter pencil rods	2' 0"	19"
$\frac{1}{2}$ " diameter pencil rods	2' 6"	12"
$\frac{3}{4}$ "—3 lb. per ft., cold- or hot-rolled channel	3' 0"	24"
	3' 6"	19"
	4' 0"	16"
1"—.410 lb. per ft., hot-rolled channel	4' 0"	24"
	4' 6"	19"
	5' 0"	12"

TABLE NO. 47-D — REQUIRED THICKNESS OF INTERIOR PLASTER

BACKING	THICKNESS OF PLASTER INCLUDING FINISH COAT FROM FACE OF PLASTER BASE (Inches)
Metal or Wire Lath	$\frac{5}{8}$ minimum ¹
All other types allowed	$\frac{3}{4}$ minimum
Unit Masonry and Concrete Walls	$\frac{3}{4}$ minimum
Monolithic Concrete Ceilings	$\frac{3}{8}$ minimum- $\frac{3}{4}$ maximum

¹ Plaster thickness when measured from the back plane of metal lath, wire lath or wire fabric lath, exclusive of ribs, shall be $\frac{3}{4}$ -inch minimum.

TABLE NO. 47-E — GYPSUM OR HARDWALL PLASTER

NUMBER OF COATS	COATS	GYPSUM PLASTER (Pounds)	DAMP LOOSE SAND (Pounds)	VERMICULITE OR PERLITE (Cubic Feet)
Two-Coat Work (Double-up Method)	Base coat on gypsum lath	100	250	2
	Base coat on Unit Masonry (except over monolithic concrete)	100	300	3
Three-Coat Work	First (scratch) coat on lath	100	200 ²	2
	First (scratch) and second (brown) coat on Unit Masonry	100	300	3
	All second (brown) coats	100	300 ²	2 ¹

¹Where the plaster is 1 inch or more in total thickness, the volume of vermiculite or perlite for the brown coat may be increased to 3 cubic feet.

²In lieu of this proportioning, proportions may be 100 pounds of gypsum neat plaster, to not more than 250 pounds of damp, loose sand, provided this proportioning is used for both scratch and brown coat.

Note: Combinations of sand and lightweight aggregate may be used, provided that the volume and weight relationship of the combined aggregates to gypsum plaster is maintained as per Table No. 47-E. Combinations of sand and lightweight aggregate are not permitted where more than one-hour fire resistance is required.

TABLE NO. 47-F REPEALED**TABLE NO. 47-G REPEALED**

TABLE NO. 47-H — PORTLAND CEMENT PLASTERS

PORTLAND CEMENT PLASTER

COAT	VOLUME CEMENT	MAXIMUM WEIGHT (OR VOLUME) LIME PER VOLUME CEMENT ⁽¹⁾	MAXIMUM VOLUME OF SAND PER VOLUME OF CEMENT	MINIMUM THICKNESS	MINIMUM PERIOD MOIST CURING	MINIMUM INTERVAL BETWEEN COATS
First	1	20 lbs./cu. ft.	4	$\frac{1}{2}$ " ⁽²⁾	48 hours ^{(3) (5)}	48 hours ^{(4) (5)}
Second	1	20 lbs./cu. ft.	5	First and second coats $\frac{3}{4}$ "	48 hours	7 days ⁽⁶⁾
Third	1	1 ⁽⁷⁾	3	Thickness of Three coats $\frac{7}{8}$ "		⁽⁶⁾

PORTLAND CEMENT-LIME PLASTER⁽⁸⁾

COAT	VOLUME CEMENT ⁽⁹⁾	MAXIMUM VOLUME LIME PER VOLUME CEMENT	MAXIMUM VOLUME SAND PER COMBINED VOLUMES CEMENT AND LIME	MINIMUM THICKNESS	MINIMUM PERIOD MOIST CURING	MINIMUM INTERVAL BETWEEN COATS
First	1	1	4	$\frac{1}{2}$ " ⁽²⁾	48 hours ^{(3) (5)}	48 hours ^{(4) (5)}
Second	1	1	4½	First and second coats $\frac{3}{4}$ "	48 hours	7 days ⁽⁶⁾
Third	1	1 ⁽⁷⁾	3	Thickness of Three Coats $\frac{7}{8}$ "		⁽⁶⁾

NOTES:

- (1) Up to 20 pounds of dry hydrated lime (or an equivalent amount of lime putty) may be used as a plasticizing agent in proportion to each sack (cubic foot) of Type I and Type II Standard portland cement in first and second coats of plaster. See Section 91.4712(b) for use of plasticity agents.
- (2) Measured from face of support or backing to crest of scored plaster.
- (3) Twenty-four hours minimum period for moist curing of interior portland cement plaster.
- (4) Twenty-four hours minimum interval between coats of interior portland cement plaster.
- (5) Twenty-four hour interval for exterior walls of wood-framed buildings where adjoining existing structures prohibit finishing in final position.
- (6) Finish coat plaster may be applied to interior portland cement base coats after a 48-hour period.
- (7) For finish coat plaster, up to an equal part of dry hydrated lime by weight (or an equivalent amount of lime putty) may be added to Types I, II or III Standard portland cement.
- (8) No additions of plasticizing agents shall be made.
- (9) Type I, II or III Standard portland cement. See Section 91.4712(b) for use of plasticity agents.

**TABLE NO. 47-I — ATTACHMENTS FOR EXTERIOR
PLASTER REINFORCEMENT, STRING WIRES
AND PAPER BACKING**

TYPE OF CONSTRUC- TION	ATTACHMENTS ¹ FOR		
	STRING WIRES ² (MAX. 6" APART— VERTICALLY)	PAPER BACKINGS	REINFORCEMENT (FURRED OUT MINIMUM ¼")
Wood Frame Sheathed		Nails or staples of type which will not tear paper	Furring nails, staples or other approved furring device 4"-6" apart vertically on supports
Wood Frame Open	String wire shall be fastened in place with 4d or 1½"-#13 gauge 19/64" diameter head nail 32" on center hori- zontally, stretched taut, by staggering attachment horizontally or by wrapping wire around the attachment	Nails or staples of type which will not tear paper	Furring nails, staples or other approved furring device 4"-6" apart vertically on supports
Steel Frame Open	No. 18 ga. wire ties— 32" on center hori- zontally ²	Approved clip or other attachment	Approved clip or other attach- ment—6" apart—vertically on supports
Masonry or Concrete (When rein- forcement is used)			Approved furring device 6" apart vertically and 18" apart horizontally

NOTES:

1. Attachments: All nails, staples or other metal attachments shall be corrosion resistant.
2. Wire: All tie and string wire shall be minimum No. 18 gauge, galvanized soft annealed wire.
3. Paper Backing: Paper backing may be omitted in the following cases:
 - (a) When exterior covering is of approved weatherproof panels;
 - (b) In back-plastered construction;
 - (c) When there is no human occupancy;
 - (d) Over water-repellent panel sheathing;
 - (e) Under paper backed wire fabric;
 - (f) Under metal lath, wire lath or wire fabric lath on incombustible construction.
4. Penetration of Nails, Staples, etc. All attaching nails, staples or other penetrating devices must penetrate vertical supports a minimum of ¾-inch; horizontal supports a minimum of 1¼ inches.
5. All paper backing shall be lapped sufficiently to shed water.

SEC. 91.4712 — EXTERIOR PLASTERING — APPLICATION

(a) General. Exterior cement plaster shall be Portland cement plaster meeting the requirements of Table No. 47-H, except when applied over concrete or masonry.

Corner reinforcement may be used on exterior plaster. Such reinforcement shall be treated with corrosion protection and shall be perforated or expanded to insure mechanical bond and a solid corner.

(b) Plasticity Agents. Plasticity agents shall be of types approved by the Superintendent of Building and when added in the mixing of portland cement plaster shall be used in an amount not exceeding that specified in the approval.

TABLE NO. 47-J APPLICATION OF SINGLE-PLY GYPSUM WALLBOARD

Thickness (Inch)	Surface	Long Dimension of Sheets in Relation to Framing Members	Maximum Spacing of Framing Members (1) (Inches)	MAXIMUM SPACING OF FASTENERS (1) (Inches)				Nails (2) To Wood
				Nails Only (3)	Nails Adhesive	Screws Only (4)	Screws & Adhesive (4)	
$\frac{1}{2}$	Ceiling	Parallel	16	7	16	12	16	No. 13 gage, $1\frac{1}{4}$ " long, $19/64$ " head; or 0.098" gage, $1\frac{1}{4}$ " long, annular ringed; or 5d, No. 13 $\frac{1}{2}$ gage, $1\frac{1}{2}$ " long, $15/64$ " head.
	Ceiling	Perpen- dicular	24	7	12	12	16	
	Wall	Either Direction	24	8	16	12	24	
$\frac{5}{8}$	Ceiling	Parallel	16	7	16	12	16	No. 13 gage, $1\frac{1}{4}$ " long, $19/64$ " head; or 0.098" gage, $1\frac{1}{4}$ " long, annular ringed; or 6d, No. 13 gage, $1\frac{1}{2}$ " long, $\frac{1}{4}$ " head
	Ceiling	Perpen- dicular	24	7	12	12	12	
	Wall	Either Direction	24	8	12	12	16	

NOTES: (1) Fire-resistive assemblies and shear panels generally use supports at 16" o.c. and shear panels use nails only.

(2) Metal framing — Use ring shanked nails into clinching teeth formed by two metal edges and barbed or cooler nails into nailing grooves holding the sides of nails.

(3) Two nails at 2" to 2 $\frac{1}{2}$ " apart may be used if the pairs are spaced 12" o.c., except around the perimeter of sheets, in fire-resistive assemblies, or in shear panels.

(4) Screws shall be No. 6 with tapered heads and of a length to penetrate wood framing $\frac{3}{8}$ " and metal $\frac{1}{4}$ " minimum.

Lime may be added to approved portland cement plaster or portland cement-lime plaster as indicated in Table No. 47-H.

When plasticity agents are added in the manufacturing process conforming to the requirements of Section 91.4702 pertaining to plaster or waterproofing cements, no later additions of plasticity agents shall be made.

(c) **Application. 1. General.** Except when applied to concrete or masonry, and except as otherwise provided for pneumatically applied plaster, exterior cement plastering materials shall be mixed by machine methods for not less than two minutes, and shall be applied in three coats as set forth in Table No. 47-H.

The first coat shall be forced through all openings in the reinforcement so as to completely embed reinforcement and to solidly fill all spaces. It shall then be scored horizontally with a scratcher having $\frac{1}{8}$ inch clipped teeth and grooves not more than $\frac{1}{8}$ inch deep.

The second coat shall be rodded and water floated, with no variation greater than $\frac{1}{4}$ inch in any direction under a five-foot straight edge.

2. Plastering on masonry or concrete. The masonry surface on which plaster is to be applied shall be clean, free of efflorescence, damp, and sufficiently rough to insure proper bond. Mixtures specified for the second coat in this Section may be applied directly to masonry.

SEC. 91.4713 — PNEUMATICALLY PLACED PLASTER

Pneumatically placed cement plaster shall be a mixture of portland cement and sand, mixed dry, conveyed by air through a pipe or flexible tube, hydrated at the nozzle at the end of the conveyor, and deposited by air pressure in its final position.

Rebound material may be screened and reused as sand in an amount not greater than 25% of the total sand in any batch.

Pneumatically placed cement plaster shall consist of a mixture of one part cement to not more than five parts sand. Plasticity agents may be used as specified in Section 91.4712 (b). Except when applied to concrete or masonry, such plaster shall be applied in not less than two coats to a minimum total thickness of $\frac{1}{2}$ inch. The first coat shall be rodded as specified in Section 91.4712 (c) for the second coat. The curing period and time interval shall be as set forth in Table No. 47-H.

SEC. 91.4714 — GYPSUM WALLBOARD

(a) **General.** Gypsum wallboard shall be installed as set forth in this Section and Table No. 47-J with all edges and ends of wallboard sheets located over framing members, except for joints perpendicular to the main framing. The edges and ends of adjoining sheets shall be in moderate contact and the fasteners shall hold the panels in firm contact with the framing.

Gypsum wallboard shall not be installed until all exterior framing is covered.

(b) **Framing.** Wood or metal framing shall be straight and true. Wood ceiling stripping shall be 2" x 2" minimum for nailing and 1" x 3" for screw attachment. Other furring shall be not less than 1" x 2". Metal members or furring shall be not less than No. 25 gage.

(c) **Attachment.** Fasteners shall not fracture the face paper and shall be not less than $\frac{1}{8}$ " from edges or ends of the panels. Shear panels, Section 91.2512, or fire-resistive assemblies, Tables

Nos. 43-B or 43-C, may require supports and attachments in excess of the requirements of this Section.

Single-ply gypsum wallboard may be adhesively applied to wood framing, provided a continuous bead of adhesive, sufficient in size to produce a 1/16" thick by 1" wide contact, is applied to the main framing members, and fasteners per Table No. 47-J are used. Two continuous beads of adhesive are required where edge or end joints occur over a single member.

(d) **Two-ply Application.** Two layers of 3/8-inch gypsum wallboard may be applied to framing members at 16 inches on center with the base layer nailed as required by Table No. 47-J for 1/2-inch wallboard and the face layer laminated with an adhesive. Other two-ply applications of gypsum wallboard and studless partitions may be permitted when the installation method is approved by the Department.

DIVISION 48 — DWELLINGS AND ACCESSORY BUILDINGS

SEC. 91.4801 — GENERAL

(a) **Purpose of Division.** The purpose of this Division is to provide minimum standards for safe methods of construction for conventionally framed wood frame dwellings, one-story masonry dwellings of brick and concrete masonry units, and accessory buildings. Masonry accessory buildings constructed under this Division shall be limited to one story in height. Applicable portions of dwellings or accessory buildings of unusual shape, size or split levels shall be designed to resist lateral forces in accordance with other divisions of this Code. Dwellings in areas designated as "High Wind Velocity Areas" shall conform to such additional requirements as determined under the provisions of Subsection 91.2305(o). The provisions of this Division shall not be presumed to exclude any method of design or type of construction meeting all requirements of the other divisions of this Code. Where such buildings are specifically designed in accordance with other divisions of this Code, the provisions of this Division shall not apply.

(b) **Definitions.** For the purpose of this Division, certain terms are defined as follows:

Accessory Building—A building the use of which is incidental to the dwelling and which is located on the same lot.

Dwelling—A habitation containing not more than two kitchens and not more than five rented rooms.

(c) **Inspection Required.** The permit holder or his agent shall notify the Superintendent of Building when the building is ready for each of the following inspections:

1. **Foundations:** When the excavation for footings is completed and all forms and required reinforcing steel are in place, but before any concrete is poured;

2. **Wood Framing:** When all wood roof, wall and floor framing, fireblocking and bracing is completed and all pipes, rough plumbing, chimneys, vents and plaster grounds are in place, but before any interior wall covering is in place;

3. **Reinforced Masonry:** In grouted masonry when vertical reinforcing steel is in place and other reinforcing steel distributed and ready for placing but before any units are laid up.

In filled cell construction, when the vertical reinforcing steel is in place in the open cells, before the cells are filled;

4. **Plastering:** When the backing and lath is in place ready for plaster or stucco;

5. **Final:** When the building is completed and ready for occupancy.

SEC. 91.4806 — MATERIALS OF CONSTRUCTION

(a) **Lumber.** All lumber used for construction shall be designed as required by Division 25 of this Article, or shall conform to the arbitrary spans and uses as set forth in this Division.

Wood framing members used in conformance with the arbitrary limits of this Division shall be divided into classifications according to species and grades as set forth in Table No. 48-B or Table No. 25-A.

**TABLE NO. 48-A — DIMENSIONS AND DEPTHS
FOR FOOTINGS***

Number of Stories	Depth below undisturbed Ground Surface (Inches)	FOOTING		FOOTING WALL	
		Width (Inches)	Thickness (Inches)	Thickness (Inches)	Height Above Finish Grade (Inches)
1	12	12	6	6	6
2	18	16	8	8	6
3	24	21	10	10	6
Piers not under partitions	6	12 x 12	12		6
Piers under partitions not supporting second floor loads	6	16 x 16	12		6

*NOTE: The ground under the floor may be excavated to the elevation of the top of the footing.

All lumber shall be stamped with a grademark by an approved grading agency. The grademark shall include the symbol of the approved grading agency, and the grade and species of lumber.

Where growth characteristics or defects are present in any wood member in such a combination that they affect the serviceability of the member, the member shall not be used.

Grademarked lumber that is remanufactured into smaller sizes by cross cutting, ripping, resawing, or planing shall be regraded and remarked as required by this Section.

Surfaced lumber may be used wherever a minimum nominal size is specified in this Division. One-inch nominal thickness boards shall include American Standard Lumber of $\frac{3}{4}$ -inch dry ($\frac{1}{2}$ -inch green) minimum thickness.

All wood in direct contact with the ground, or all wood in direct contact with masonry or concrete at a point within 48 inches of the ground, shall be treated with a preservative, or shall be decay-resistant wood as prescribed in Division 31 (Wood Preservatives).

All plywood used for construction shall conform to the grade-marking and specification requirements of Division 25 of this Article.

(b) **Masonry.** All masonry units and unit masonry shall conform to the requirements of Division 24 of this Code.

(c) **Mortar.** All mortar used in masonry shall conform to the requirements of Division 24 of this Code.

(d) **Concrete.** All concrete shall conform to the requirements of Division 26 of this Article. Concrete for footings shall be composed of not more than seven cubic feet of combined fine and coarse aggregates, and not more than 8½ gallons of water per sack of cement.

SEC. 91.4807 — FOUNDATIONS AND FOOTINGS

(a) **Materials.** Footings shall be of masonry or poured concrete.

(b) **Foundations.** Footings supporting buildings shall bear upon a foundation of undisturbed natural soil or rock, or approved controlled fill conforming to Division 30 of this Code.

EXCEPTION: The Superintendent of Building may approve deviations for one story metal or wood frame construction

only after receiving a written opinion from an approved foundation investigation agency together with substantiating evidence.

(c) Repealed.

(d) **Continuous Footings.** Footings shall be continuous under all interior partitions carrying second floor loads and under all exterior walls. Other interior footings may be piers.

Continuous footings may be omitted across door openings of an attached garage where the garage has a concrete floor slab and the building rests on natural ground.

(e) **Dimensions.** All footings shall have minimum dimensions and depths as set forth in Table No. 48-A.

Footing walls other than retaining walls shall be reinforced as required for bearing walls in Division 24 or Division 28 when the height above lower finish grade exceeds four feet.

(f) **Sloping Ground.** Excavations in sloping ground shall be stepped to provide level bearing for footings and sill plates. The steps in the footing wall shall overlap the steps in the excavation by a distance not less than the depth of the step in the excavation.

**TABLE NO. 48-B — ABBREVIATED LISTING
OF LUMBER SPECIES AND GRADES
FOR USE WITH TABLES IN DIVISION 48⁽¹⁾**

Species and Grade	Size Classification	"Fb" Allowable Stress in Bending, psi.		"E" Modulus of Elasticity, psi
		Single Member ⁽²⁾	Repetitive Member ⁽³⁾	
DOUGLAS FIR-LARCH				
Select Structural	2" to 4"	2100	2400	1,800,000
No. 1	thick x	1750	2050	1,800,000
No. 2	2" to 4"	1450	1650	1,700,000
No. 3	wide	800	925	1,500,000
Construction	2" to 4"	1050	1200	1,500,000
Standard	thick x	600	675	1,500,000
Stud	4" wide	800	925	1,500,000
Select Structural	2" to 4"	1800	2050	1,800,000
No. 1	thick x	1500	1750	1,800,000
No. 2	6" and	1250	1450	1,700,000
No. 3	wider	725	850	1,500,000
Decking or Dex	2" min. thick	Over 1600	1,700,000
HEM-FIR				
Select Structural	2" to 4"	1650	1900	1,500,000
No. 1	thick x	1400	1600	1,500,000
No. 2	2" to 4"	1150	1300	1,400,000
No. 3	wide	625	725	1,200,000
Construction	2" to 4"	825	975	1,200,000
Standard	thick x	450	525	1,200,000
Stud	4" wide	625	725	1,200,000
Select Structural	2" to 4"	1400	1650	1,500,000
No. 1	thick x	1200	1400	1,500,000
No. 2	6" and	1000	1150	1,400,000
No. 3	wider	575	675	1,200,000
Decking or Dex	2" min. thick	Over 1250	1,400,000

For other species, grades and Grading Rules see National Design Specifications

NOTES:

(1) For engineered designs, use Table No. 25-A for species, grades, stresses and applicable notes.

(2) Single member "Fb" values shall be used with Tables No. 48-E (Girders), 48-K (Ceiling Joists), and 48-R (Lintels).

(3) Repetitive member "Fb" values may be used with Tables No. 48-F (Floor Joists), 48-L (Rafters), and 48-N (2" Floor and Roof Decking).

(g) **Slab Footings.** If not more than 1,000 square feet in area, any one-story building not used for residential purposes having wood or steel stud bearing walls may rest upon a concrete slab. Such slab shall be three inches or more in thickness if supported by undisturbed natural soil. If resting upon filled ground, such slab shall be at least four inches thick and shall also be reinforced with six-inch by six-inch No. 10 by No. 10 welded wire fabric one inch below the top surface of the slab or equivalent reinforcement. Exterior walls resting upon an unreinforced slab shall be supported by a footing eight inches wide extending eight inches into natural ground.

(h) **Accessory Buildings.** One-story wood frame buildings not to be used for human occupancy may rest on a mudsill placed on the ground surface if the building has no wood floor and is not more than 20 feet in width.

SEC. 91.4808 — NAILING REQUIREMENTS

The number of nails connecting wood members shall be not less than the amounts set forth in Table No. 48-C.

SEC. 91.4809 — UNDERFLOOR CONSTRUCTION

(a) **Ventilation and Access.** Openings for ventilating the underfloor space shall be provided on at least three sides of the building and in all interior footing walls. The net ventilating area of the openings shall be proportioned on the basis of two square feet for each 25 lineal feet of exterior wall. One opening shall be located within three feet of each end of the wall. Openings in exterior walls shall be screened with corrosion-resistant metal mesh having one-fourth inch openings. Openings in the footing wall shall be not less than six inches above the adjoining finish grade.

There shall be one access opening in the exterior foundation wall to the underfloor air space not less than 18 inches in height and 24 inches in width. Where continuous interior foundation walls are used, similar openings shall be provided to all areas of underfloor space.

EXCEPTION: The exterior access opening may be less than six inches above the adjoining grade if surrounded by a wall extending six inches above the adjoining grade and arranged to prevent entrance of storm water.

(b) **Ground Surface Plane.** The ground surface plane under the floor shall be at least:

1. 12 inches below girders supporting floor joists;
2. 18 inches below floor joists or subfloor in plank type floor construction.

RULE OF GENERAL APPLICATION, #17-69 APPLIES. SEE APPENDIX LISTING.

**TABLE NO. 48-C — NAILING SCHEDULE
BASED ON DOUGLAS FIR FRAMING LUMBER¹**

CONNECTION	NAILING ¹
Post to pier pad, toe nail	3-16d or 4-8d
Girder to post, toe nail	3-16d or 4-8d
Joist to sill or girder, toe nail	2-16d or 3-8d
Bridging to Joist, toe nail each end	2-8d
Joists to blocking, end nail	16d top and bottom, each joist
Rim joist to joists, end nail	16d top and bottom, each joist

Rim joist to sill, toe nail	16d @ 16" o.c.
Floor joist lap @ bearing, face nail	2-16d
1"x8" subfloor or less to each joist, face nail	2-8d
Wider than 1"x8" subfloor to each joist, face nail	3-8d
2" subfloor to joist or girder, blind and face nail	2-16d
Sole plate to joist or blocking, face nail	16d at 16" o.c.
Top plate or sole plate to stud, end nail	2-16d
Stud to sole plate, toe nail	3-16d or 4-8d
Doubled studs, face nail	16d at 24" o.c.
Doubled top plates, face nail	16d at 16" o.c.
Top plates, laps and intersections, face nail	2-16d
Continuous header, two pieces	16d at 16" o.c. along each edge
Ceiling joists to plate, toe nail	2-16d or 3-8d
Continuous header to stud, toe nail	4-8d
Ceiling joists, laps over partitions, face nail	3-16d
Ceiling joists to parallel rafter, face nail	3-16d
Rafter to ridge	2-16d or 3-8d
Rafter ties, 2" lumber, face nail	3-16d
Rafter ties, 1" lumber, face nail	5-8d
Rafter to plate, toe nail	2-16d or 3-8d
1" brace to each stud and plate, face nail (1"x6" min.)	3-8d
1"x8" sheathing or less to each bearing, face nail	2-8d
Wider than 1"x8" sheathing to each bearing, face nail	3-8d
Built-up corner studs	16d at 24" o.c.
Built-up girder and beams	20d at 32" o.c. at top and bottom and staggered 2-20d at ends and at each splice
2" planks	2-16d at each bearing
Particleboard:⁵	
Wall Sheathing (to framing):	
3/8"-1/2"	6d ²
5/8"-3/4"	8d ³
Plywood:⁵	
Subfloor, roof and wall sheathing (to framing):	
1/2" and less	6d ²
5/8"-3/4"	8d ² or 6d ⁴
7/8"-1"	8d ²
1 1/8"-1 1/4"	10d ³ or 8d ⁴
Combination Subfloor-underlayment (to framing):	
3/4" and less	6d ⁴
7/8"-1"	8d ⁴
1 1/8"-1 1/4"	10d ³ or 8d ⁴
Panel Siding (to framing):	
1/2" or less	6d ⁵
5/8"	8d ⁵
Fiberboard Sheathing:⁷	
7/16" or 1/2"	6d ² or No. 16 ga. ⁸ or No. 11 ga. ⁶
25/32"	8d ² or No. 16 ga. ⁸ or No. 11 ga. ⁶

NOTES:

¹Common or box nails may be used except where otherwise stated.

²Common or deformed shank.

³Common.

⁴Deformed shank.

⁵Nails spaced at 6 inches on center at edges, 12 inches at intermediate supports (10 inches at intermediate supports for floors), except 6 inches at all supports where spans are 48 inches or more. For nailing of plywood diaphragms and shear walls refer to 91.2514(c). Nails for wall sheathing may be common, box or casing and for panel siding may be siding or casing.

⁶Galvanized roofing nails with 7/16-inch diameter head and 1½-inch length for ½-inch sheathing and 1¾-inch for 25/32-inch sheathing.

⁷Fasteners spaced 3 inches on center at exterior edges and 6 inches on center at intermediate supports.

⁸Galvanized staple with 7/16-inch crown and 1½-inch length for ½-inch sheathing and 1½-inch length for 25/32-inch sheathing.

⁹Nails in species of wood other than Douglas Fir shall be increased to provide equivalent strength to schedule connections based on the following relative strength values:

Lumber Species	Relative Strength
Douglas Fir-Larch, So. Pine	100%
Douglas Fir, South Hem-Fir	
Pine; Idaho, Lodgepole, Ponderosa, Sugar	80%
Fir; Balsam, Subalpine	
Pine, White	
Redwood (Stud, Constr., St'd., Util.)	
Spruce	65%

(c) **Sills.** Footing sills shall be not less in size than two inches by four inches nor smaller than the studs supported directly thereon and shall be bolted to the footing wall with ½ inch by 10-inch bolts embedded at least seven inches in the footing wall. Bolts shall be provided within 12 inches of the ends of each footing sill member and not more than six feet apart elsewhere. Footing sills shall have full bearing on the footing wall or mortar bed.

(d) **Posts.** Posts supporting girders and resting upon piers shall be braced in two directions if three feet in length. Braces shall be not less than one inch by four inches, extending on a 45-degree slope from the bottom of the post to the floor joist or girder directly above. Posts shall be not less than four inches by four inches and shall rest upon a pier cap of treated or decay-resistant wood as prescribed in Division 31 (wood preservatives). The pier cap shall be not less than six inches by six inches by two inches.

EXCEPTION: Posts located within rooms or basements need not be braced.

(e) **Foundation Stud Walls.** Foundation stud walls supporting one story shall be braced as required for walls in the first story of a two-story building by Section 91.4817 (c) of this Division.

Foundation stud walls supporting two stories shall be braced by solid diagonal sheathing of one-inch nominal boards or ¾-inch plywood. All edges of plywood shall be on framing or blocking.

Sheathing or plywood shall be nailed to the sills, plates, and studs but shall be ½-inch clear of the foundation concrete. Solid blocking may be used to brace stud walls where the studs do not exceed 12 inches in height.

TABLE NO. 48-E — ALLOWABLE SPANS FOR GIRDERS CARRYING FLOOR LOADS

Size of Girder (Ins.)	Spacing of Girder (ft.)	Minimum lumber properties (psi) for spans shown					
		E = 1,300,000				E = 1,100,000	
		F _b (Single Member)	Allowable SPANS (FT) Supporting Partitions		F _b (Single Member)	Allowable SPANS (FT) Supporting Partitions	
			Yes	No		Yes	No
4 x 4	6	650	4	4	400	4	4
	8		3	3		3	3
4 x 6	6	800	6	7	550	5	6
	8		5	6		4	5
4 x 8	6	850	8	9	600	6	7
	8		6	7		5	6

NOTES:

- (1) Tabulated values are based upon a live load of 40 psf. For live loads of 50 psf, spans shall be reduced to 90 percent of tabulated values.
- (2) For "F_b" and "E" values for lumber see Table No. 48-B or National Design Specification.

(f) **Wood and Earth Separation.** No wood shall be nearer than six inches to any earth unless separated by concrete at least three inches in thickness.

Where planter boxes are installed adjacent to wood frame walls, a two-inch wide air space shall be provided between the planter and the wall. Flashing shall be installed over air spaces less than six inches in width. Where flashing is used, provisions shall be made for a circulation of air in the air space.

(g) Repealed.

(h) **Sleepers.** Wood finish flooring may be placed on sleepers supported directly upon a masonry or concrete floor, if the sleepers conform to the requirements of Section 91.4806(a).

SEC. 91.4810 — FLOOR CONSTRUCTION

(a) **Girders.** Girders carrying floor loads shall be designed to support the actual loads thereon but shall not exceed spans set forth in Table No. 48-E.

(b) **Floor Joists.** Floor joists shall be designed to support the actual loads thereon but shall not exceed the spans set forth in Table No. 48-F.

Floor joists shall have not less than 1½-inch bearing on supports or shall be supported on metal joist hangers; except that joists may be supported upon a one-inch by four-inch board let into studs, if the joists are nailed to the studs. Floor joists shall be doubled under bearing partitions running parallel to the joists. Doubled joists may be separated to permit the passage of pipes and ducts.

Joists shall lap at least four inches over supports and be securely nailed together, or shall be tied together in an approved manner.

(c) **Header Joists.** Header joists more than four feet in length shall be doubled. Tail joists for spans exceeding eight feet in length and headers receiving more than two tail joists or receiving tail joists more than eight feet long shall be supported in metal hangers, not thinner than No. 12 gauge, and at least 1½ inches in width.

(d) **Blocking or Bridging.** Joists of six inches or more in depth shall be stabilized against overturning or buckling as follows:

1. At ends under every bearing partition and at each sup-

TABLE NO. 48-F — FLOOR JOISTS**40 Lbs. Per Sq. Ft. Live Load⁽¹⁾****No Ceiling⁽²⁾ — Dry Conditions of Use****DESIGN CRITERIA:**

Deflection — For 40 lbs. per sq. ft. live load. Limited to span in inches divided by 360.
 Strength — Live load of 40 lbs. per sq. ft. plus dead load of 10 lbs. per sq. ft. determines the required fiber stress value.

JOIST SIZE SPACING (IN)	Modulus of Elasticity, "E", in 1,000,000 psi															
	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2		
2x6	8-6	8-10	9-2	9-6	9-9	10-0	10-3	10-6	10-9	10-11	11-2	11-4	11-7	11-11		
	12.0	720	780	830	890	940	1040	1080	1140	1190	1230	1280	1320	1410		
2x8	7-9	8-0	8-4	8-7	8-10	8-1	9-4	9-6	9-9	9-11	10-2	10-4	10-6	10-10		
	16.0	790	880	920	980	1040	1090	1150	1200	1250	1300	1410	1460	1550		
2x10	6-9	7-0	7-3	7-6	7-9	7-11	8-2	8-4	8-6	8-8	8-10	9-0	9-2	9-6		
	24.0	900	980	1050	1120	1190	1250	1310	1380	1440	1500	1550	1610	1670	1780	
2x12	11-3	11-8	12-1	12-6	12-10	13-2	13-6	13-10	14-2	14-5	14-8	15-0	15-3	15-9		
	12.0	720	780	830	890	940	1040	1080	1140	1190	1230	1280	1320	1410		
2x10	10-2	10-7	11-0	11-4	11-8	12-0	12-3	12-7	12-10	13-1	13-4	13-7	13-10	14-3		
	16.0	790	850	920	980	1040	1090	1150	1200	1250	1310	1360	1410	1460	1550	
2x10	8-11	9-3	9-7	9-11	10-2	10-6	10-9	11-0	11-3	11-5	11-8	11-11	12-1	12-5		
	24.0	900	980	1050	1120	1190	1250	1310	1380	1440	1500	1550	1610	1670	1780	
2x10	14-4	14-11	15-5	15-11	16-5	16-10	17-3	17-8	18-0	18-5	18-9	19-1	19-5	20-1		
	12.0	720	780	830	890	940	1040	1080	1140	1190	1230	1280	1320	1410		
2x10	13-0	13-6	14-0	14-6	14-11	15-3	15-8	16-0	16-5	16-9	17-0	17-4	17-8	18-3		
	16.0	790	850	920	980	1040	1090	1150	1200	1250	1310	1360	1410	1460	1550	
2x10	11-4	11-10	12-3	12-8	13-0	13-4	13-8	14-0	14-4	14-7	14-11	15-2	15-5	15-11		
	24.0	900	980	1050	1120	1190	1250	1310	1380	1440	1500	1550	1610	1670	1780	
2x12	17-5	18-1	18-9	19-4	19-11	20-6	21-0	21-6	21-11	22-5	22-10	23-3	23-7	24-5		
	12.0	720	780	830	890	940	1040	1080	1140	1190	1230	1280	1320	1410		
2x12	15-10	15-5	17-0	17-7	18-1	18-7	19-1	19-6	19-11	20-4	20-9	21-1	21-6	22-2		
	16.0	790	880	920	980	1040	1090	1150	1200	1250	1310	1360	1410	1460	1550	
2x12	13-10	14-4	14-11	15-4	15-10	16-3	16-8	17-0	17-5	17-9	18-1	18-5	18-9	19-4		
	24.0	900	980	1050	1120	1190	1250	1310	1380	1440	1500	1550	1610	1670	1780	

NOTES:

- (1) The required extreme fiber stress in bending, "F_b", in pounds per square inch is shown below each span in feet and inches.
- (2) Supporting ceilings of 10 lbs. per sq. ft. max., the minimum "F_b" required is 20% greater than the tabular values shown.
- (3) For live loads of 50 lbs. per sq. ft. the allowable span is 90% of that shown for the live load of 40 psf. If supporting also a ceiling of 10 lbs. per sq. ft. max., the minimum "F_b" required is 13% greater than the tabular values shown for the live load of 40 psf.
- (4) Spacing of joists may be limited by allowable span of ceiling materials or fire resistive rating unless 2" x 2" stripping is used at the required spacing.
- (5) For "F_b" and "E" values for lumber see Table No. 48-B or National Design Specification.

TABLE NO. 48-G — REPEALED

port, by solid blocking of not less than two-inch thickness and the full depth of joists, by nailing to studs when supported by ribbon boards, or by approved hangers or fastenings;

2. Between supports as required so that joists will be stabilized every eight feet by solid blocking two inches thick the full depth of the joist or by wood cross-bridging of not less than one inch by four inches or metal cross-bridging of equal strength. Where cross-bridging is used, the lower ends of such cross-bridging shall be driven up and nailed after the floor or subfloor has been nailed.

EXCEPTION: Such blocking or bridging of joists between supports is not required for floors having live loads not exceeding 40 pounds per square foot where the joist depth does not exceed 12 inches.

3. Ends of joists may be stabilized by a rim joist, in lieu of blocking, when end nailed through the rim joist. Joists less than six inches in depth shall be stabilized against overturning or buckling by solid blocking at non-lapping ends only.

(f) **Cutting and Notching.** No wood joist, beam or girder shall be cut or bored except as provided in this Subsection.

Any wood joist, beam or girder may be cut or notched on the top edge, provided the cut does not exceed either $\frac{1}{4}$ of the depth of the member or two inches and does not extend into the center $\frac{1}{4}$ of length of the member.

Holes spaced at least six inches apart and not larger than two inches in diameter may be bored through any portion of a wood joist, if the edges of the holes are not nearer than one inch to the edge of the joist.

Holes spaced at least six inches apart and not larger than one inch in diameter may be bored through any wood beam, joist or girder, if the edges of the holes are not nearer than one inch to the edge of the member.

(g) **Flooring.** Floors laid upon joist or girder construction shall be composed of subflooring and an overlay flooring or a combination subfloor-flooring.

Subflooring shall be of plywood as set forth in Table No. 48-H or shall be constructed of one-inch boards as set forth in Table No. 48-I. Overlay flooring shall be tongue and groove finish wood strip flooring not less than $\frac{3}{8}$ -inch thickness, or $\frac{1}{4}$ -inch minimum thickness covering of plywood, approved particle board conforming to Commercial Standard CS 236, or tempered hardboard conforming to Commercial Standard CS 251. End joints of subfloor materials shall occur over the center of bearing.

Material serving as combination subfloor-flooring shall be plywood subfloor-underlayment as set forth in Tables No. 48-H or 48-HH, or shall be two-inch decking as set forth in Table No. 48-N.

EXCEPTION: Joints in subfloor boards 1½-inches or more in thickness may be randomly spaced, provided the flooring covers at least three continuous spans, the planks are T & G edges and ends, or end-splined with ½-inch by 1½-inch steel splines, each plank bears on at least one support and joints are separated by at least 2¼" in adjacent pieces.

One-inch nominal strip square edged flooring, ½-inch tongue and groove flooring, or ¾-inch plywood shall be applied over random length decking used as a floor. The "strip"

**TABLE NO. 48-H — ALLOWABLE SPANS FOR
PLYWOOD FLOOR AND ROOF SHEATHING****Continuous Over Two or More Spans and
Face Grain Perpendicular to Supports⁽¹⁾**

Panel Identification Index or Thickness ⁽²⁾	Roof				Floor
	Maximum Span (Inches)		Load (psf)		Maximum Span ⁽⁴⁾ (Inches)
	Edges ⁽³⁾ Blocked	Edges Unblocked	Total Load	Live Load	
12/0	12	0	130	100	0
16/0	16	0	75	55	0
20/0	20	0	55	45	0
24/0	24	16	60	45	0
30/12	30	28	55	40	12 ⁽⁵⁾
32/16	32 ⁽⁶⁾	28	50 ⁽⁷⁾	40	16 ⁽⁷⁾
36/16	36	30	50 ⁽⁸⁾	35 ⁽⁹⁾	16 ⁽⁷⁾
42/20	42	32	45 ⁽⁸⁾	35 ⁽⁹⁾	20 ⁽⁷⁾
48/24	48	36	40 ⁽⁸⁾	40	24
Subfloor- Underlayment					
1-1/8" Groups 1 & 2	72	48	30	30	48
1-1/4" Groups 3, 4	72	48	35	25	48

NOTES:

- (1) These values apply for Structural I and II, C-D, and C-C grades only. Spans shall be limited to values shown because of possible effect of concentrated loads.
- (2) Identification Index appears on panels in the construction grades listed in footnote (1) through 3/4-inch thickness.
- (3) For roof live load of 40 psf or total load of 55 psf, decrease spans by 13 per cent or use panel with next greater identification index.
- (4) Plywood edges shall have approved tongue and groove joints or shall be supported with blocking, unless 1/4-inch minimum thickness underlayment is installed, or finish floor is 25/32-inch wood strip. Allowable uniform load based on deflection of 1/360 of span is 100 psf.
- (5) 1/2-inch, Structural I, when continuous over one support, may be laid with face grain parallel to supports, provided all panel edges are blocked or other approved type edge support is provided, the spacing of the supports does not exceed 24-inches on center, and the live load does not exceed 25 pounds per square foot. For other grades, a minimum thickness of 3/8-inch, or 1/2-inch (5 ply), is required.
- (6) May be 16 inches if 25/32-inch wood strip flooring is installed at right angles to joists.
- (7) May be 24-inches if 25/32-inch wood strip flooring is installed at right angles to joists.
- (8) Common nail sizes for plywood: 1/2-inch-6d, 3/8-inch, 3/4-inch, 7/8-inch-8d, 1 1/8-inch, 1 1/4-inch-8d deformed shank or 10d. Nails to be spaced at six inches o.c. at panel edges and 12 inches o.c. at intermediate supports for spans to 24 inches and six inches o.c. at all supports for 48 inch span.
- (9) Edges of sheathing may be blocked with lumber, connected by rigid metal "H" clips at midspan (or third points for spans over 42 inches), or connected by other approved means to prevent unequal deflections of adjacent edges. Only lumber blocking qualifies as edge support.

and tongue-and-groove flooring shall be applied at right angles to the span of the planks. The 3/8-inch plywood shall be applied with the face grain at right angles to the span of the planks.

Where girder construction without floor joists is used, bearing partitions shall be supported by girders or continuous footing walls, and blocking shall be provided under all partitions.

(h) **Masonry, Tile, Concrete or Asphalt Floors.** Floors of masonry, concrete or asphalt may be laid directly upon the ground. Concrete floors supported upon the ground shall be not less than three inches thick and if supported upon more than six inches of firm filled ground shall be reinforced with six-inch by six-inch No. 10 by No. 10 wire mesh or equivalent.

**TABLE NO. 48-HH — ALLOWABLE SPANS FOR
PLYWOOD COMBINATION SUBFLOOR-UNDERLAYMENT⁽¹⁾**
Plywood Continuous over Two or More Spans and
Face Grain Perpendicular to Supports

Species Groups (2)	Maximum Spacing of Joists (inches)		
	16	20	24
1	1/2	5/8	3/4
2, 3	5/8	3/4	7/8
4	3/4	7/8	1

NOTES:

- (1) Applicable to Underlayment grade with ext. glue, C-C (Plugged) and all grades of sanded exterior type plywood. Spans limited to values shown because of possible effect of concentrated loads. Allowable uniform load based on deflection of 1/360 of span is 100 psf. Plywood edges shall have approved tongue and groove joints or shall be supported with blocking, unless 1/4-inch minimum thickness underlayment is installed, or finish floor is 25/32-inch wood strip. If wood strips are perpendicular to supports, thickness shown for 16-inch and 20-inch spans may be used on 24-inch span.
- (2) For species Group—See U.S. Department of Commerce Product Standard PS-1.

**TABLE NO. 48-I—ALLOWABLE SPANS FOR 1-INCH
FLOOR AND ROOF SHEATHING**

SPAN (inches)	MINIMUM THICKNESS (inches) OF LUMBER PLACED ⁽¹⁾	
	PERPENDICULAR TO SUPPORTS	DIAGONALLY TO SUPPORTS
FLOORS (L.L. = 50 psf. max.)		
24	¾ DRY (25/32 GRN)	¾ DRY (25/32 GRN)
16	¾ DRY (11/16 GRN) ⁽¹⁾	¾ DRY (11/16 GRN) ⁽²⁾
ROOFS (L.L. = 20 psf. max.)		
24	¾ DRY (11/16 GRN) ⁽¹⁾	¾ DRY (25/32 GRN)

NOTES:

- (1) Special board thicknesses—must be grademarked for species, dressed thickness, and condition of seasoning at time of dressing.
- (2) Sheathing lumber shall meet the following minimum grade requirements:

SOLID-FLOOR OR ROOF SHEATHING	SPACED-ROOF SHEATHING	GRADING RULES
Utility	Standard	WCLB or WWPA
4 Common	3 Common	WWPA
Merchantable	Constr. Com.	RIS

TABLE NO. 48-J — REPEALED

Masonry floors and tile floors shall have not more than 2¼ inches of thickness if supported upon wood members. Floor joists shall be framed to permit the installation of tile and cement finish floors without cutting or notching joists.

SEC. 91.4811 — CEILING CONSTRUCTION

(a) **Ceiling Joists.** Maximum spans for ceiling joists shall not exceed those listed in Table No. 48-K.

Ceiling joists shall have a minimum end bearing 1½ inches in length or shall be framed into a header joist by solid blocking.

(b) **Attic Access and Ventilation.** Attic access and ventilation shall conform to the requirements of Division 32.

SEC. 91.4812 — ROOF FRAMING

(a) **General.** The framing details required in this subsection apply to roofs having a minimum pitch of 3:12 or greater. When the roof pitch is less than 3:12, members supporting rafters and

TABLE NO. 48-K — CEILING JOISTS
10 Lbs. Per Sq. Ft. Live Load
Board Type Ceiling⁽³⁾ — Dry Conditions of Use

DESIGN CRITERIA:

Deflection — For 10 lbs. per sq. ft. live load. Limited to span in inches divided by 240.
 Strength — live load of 10 lbs. per sq. ft. plus dead load of 5 lbs. per sq. ft. determines required fiber stress value.

JOIST SIZE SPACING (IN)	Modulus of Elasticity, "E", in 1,000,000 psi															
	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.4	2.6
2x4	9-10	10-3	10-7	11-3	11-7	12-2	12-5	12-8	12-11	12-11	12-11	12-11	12-11	12-6	12-6	12-6
	7-10	8-1	8-5	8-8	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11
	9-10	10-3	10-7	11-3	11-7	12-2	12-5	12-8	12-11	12-11	12-11	12-11	12-11	12-6	12-6	12-6
	7-10	8-1	8-5	8-8	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11
2x6	15-6	16-1	16-8	17-2	17-8	18-2	18-8	19-1	19-8	19-11	20-3	20-8	21-0	21-8	21-8	21-8
	7-10	7-10	8-1	8-5	8-8	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11
	15-6	16-1	16-8	17-2	17-8	18-2	18-8	19-1	19-8	19-11	20-3	20-8	21-0	21-8	21-8	21-8
	7-10	7-10	8-1	8-5	8-8	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11
2x8	20-5	21-2	21-11	22-8	23-4	24-0	24-7	25-2	25-8	26-2	26-8	27-2	27-8	28-7	28-7	28-7
	7-10	7-10	8-1	8-5	8-8	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11
	20-5	21-2	21-11	22-8	23-4	24-0	24-7	25-2	25-8	26-2	26-8	27-2	27-8	28-7	28-7	28-7
	7-10	7-10	8-1	8-5	8-8	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11
2x10	26-0	27-1	28-0	28-11	29-6	30-7	31-4	32-1	32-9	33-5	34-1	34-8	35-4	36-5	36-5	36-5
	7-10	7-10	8-1	8-5	8-8	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11
	26-0	27-1	28-0	28-11	29-6	30-7	31-4	32-1	32-9	33-5	34-1	34-8	35-4	36-5	36-5	36-5
	7-10	7-10	8-1	8-5	8-8	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11

NOTES: (1) The required extreme fiber stress in bending, " F_b ", in pounds per square inch is shown below each span in feet and inches. (2) For plastered ceilings the required "E" value is 50% greater than shown in the tabular headings. (3) Spacing of joists may be limited by allowable span of ceiling materials or fire resistive rating unless 2" x 2" strip-ping is used at the required spacing. (4) For " F_b " and "E" values for lumber see Table No. 48-B or National Design Specification.

ceiling joists such as ridge boards, hips and valleys shall be designed as beams.

Rafters shall have maximum spans not exceeding those listed in the applicable portion of Table No. 48-L.

(b) **Framing.** Rafters shall be framed directly opposite each other at the ridge. There shall be a ridge-board at least one inch thick at all ridges, not less in depth than the cut end of the rafter. At all valleys and hips, there shall be a valley or hip rafter not less than two inches thick and not less in depth than the cut end of the rafter.

(c) **Rafter ties.** Rafters shall be nailed to adjacent ceiling joists to form a continuous tie between exterior walls when such joists are parallel to the rafters. Where not parallel, rafters shall be tied by members located directly above the ceiling joists.

For rafters which qualify for the span tables of this Division for dead loads of 7 or 10 pounds per square foot, the rafter ties shall be spaced not more than 4 feet on center and ties, other than ceiling joists, shall be not less than 1-inch by 6-inches in size.

Where the rafters require the use of span tables for dead loads exceeding 10 pounds per square foot, the rafter ties shall be 2-inches in thickness and located to not exceed an average spacing of 2 feet.

Nailing of rafter ties shall be as shown in Table No. 48-C.

(d) **Purlins.** Purlins to support roof loads may be installed to reduce span of rafters within allowable limits and shall be supported by struts to bearing walls. The maximum span of a 2" x 4" purlin shall be four feet. The maximum span of a 2" x 6" purlin shall be six feet, but in no case shall the purlin be smaller than the supported rafter. Purlin struts shall be not smaller than two inches by four inches and if the length exceeds eight feet, it shall be at least a 4" x 4" member. The minimum angle of purlin struts to the horizontal shall be not less than 45°.

(e) **Roof Drainage.** Roof drainage shall comply with the requirements of Section 91.3203.

EXCEPTION: Roof systems using the rafter span tables in this Division and which are sloped for drainage not less than ¼-inch per foot shall be considered as satisfying the requirements of Section 91.3203(a).

(f) **Roof Sheathing.** Roof sheathing shall be limited to the spans and thicknesses set forth in Table No. 48-H for plywood or Table No. 48-I or 48-N for lumber.

Roof decking 1 1/2-inches or more in thickness may have joints randomly spaced if conforming to the Exception to Section 91.4810(g).

(g) **Roof Rafter Blocking.** Solid blocking or equivalent support shall be provided at all bearing points for roof rafters which exceed eight inches in depth.

SEC. 91.4813 — WEATHERPROOFING

(a) **General.** The provisions of this Section shall apply to all buildings containing habitable rooms. Every weight designation for building paper or felt shall mean the weight of 108 square feet of material.

(b) **Walls.** All exterior wall coverings in buildings containing habitable rooms shall be applied over waterproof building paper or 14-pound asphalt saturated felt or approved water-repellent

TABLE 48-L-1 — LOW OR HIGH SLOPE RAFTERS

20 Lbs. Per Sq. Ft. Live Load

Board Type Ceiling⁽²⁾ — Dry Conditions of Use

DESIGN CRITERIA:

Strength — 15 lbs. per sq. ft. dead load plus 20 lbs per sq. ft. live load determines required fiber stress.

Deflection — For 20 lbs. per sq. ft. live load. Limited to span in inches divided by 240.

RAFTERS: Spans are measured along the horizontal projection and loads are considered as applied on the horizontal projection.

RAFTER SIZE SPACING (IN)		Allowable Extreme Fiber Stress in Bending, "F _b " (psi).														
(IN)		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
2x6	12.0	8-6 0.26	9-4 0.35	10-0 0.44	10-9 0.54	11-5 0.64	12-0 0.75	12-7 0.85	13-2 0.98	13-8 1.11	14-2 1.24	14-8 1.37	15-2 1.51	15-8 1.66	16-1 1.81	16-7 1.96
	16.0	7-4 0.23	8-1 0.30	8-8 0.38	9-4 0.46	9-10 0.55	10-5 0.65	10-11 0.75	11-5 0.85	11-10 0.97	12-4 1.07	12-9 1.19	13-2 1.31	13-7 1.44	13-11 1.56	14-4 1.70
	24.0	6-0 0.19	6-7 0.25	7-1 0.31	7-7 0.38	8-1 0.45	8-6 0.53	8-11 0.61	9-4 0.70	9-8 0.78	10-0 0.88	10-5 0.97	10-9 1.07	11-1 1.17	11-5 1.28	11-8 1.39
2x8	12.0	11-2 0.26	12-3 0.35	13-3 0.44	14-2 0.54	15-0 0.64	15-10 0.75	16-7 0.86	17-4 0.98	18-0 1.11	18-9 1.24	19-5 1.37	20-0 1.51	20-8 1.66	21-3 1.81	21-10 1.96
	16.0	9-8 0.23	10-7 0.30	11-6 0.38	12-3 0.46	13-0 0.55	13-8 0.65	14-4 0.75	15-0 0.85	15-7 0.96	16-3 1.07	16-9 1.19	17-4 1.31	17-10 1.44	18-5 1.56	18-11 1.70
	24.0	7-11 0.19	8-8 0.25	9-4 0.31	10-0 0.38	10-7 0.45	11-2 0.53	11-9 0.61	12-3 0.70	12-9 0.78	13-3 0.88	13-8 0.97	14-2 1.07	14-7 1.17	15-0 1.28	15-5 1.39
2x10	12.0	14-3 0.26	15-8 0.35	16-11 0.44	18-1 0.54	18-2 0.64	19-2 0.75	20-2 0.86	21-2 0.98	22-1 1.11	23-0 1.24	23-11 1.37	24-9 1.51	25-6 1.66	26-4 1.81	27-10 1.96
	16.0	12-4 0.23	13-6 0.30	14-8 0.38	15-8 0.46	16-7 0.55	17-6 0.65	18-4 0.75	19-2 0.85	19-11 0.96	20-8 1.07	21-5 1.19	22-1 1.31	22-10 1.44	23-5 1.56	24-1 1.70
	24.0	10-1 0.19	11-1 0.25	11-11 0.31	12-9 0.38	13-6 0.46	14-3 0.53	15-0 0.61	15-8 0.70	16-3 0.78	16-11 0.88	17-6 0.97	18-1 1.07	18-7 1.17	19-2 1.28	19-8 1.39
2x12	12.0	17-4 0.26	19-0 0.35	20-6 0.44	21-11 0.54	23-3 0.64	24-7 0.75	25-9 0.86	26-11 0.98	28-0 1.11	29-1 1.24	30-1 1.37	31-1 1.51	32-0 1.66	32-11 1.81	33-10 1.96
	16.0	15-0 0.23	16-6 0.30	17-9 0.38	19-0 0.46	20-2 0.55	21-3 0.65	22-4 0.75	23-3 0.85	24-3 0.96	25-2 1.07	26-0 1.19	26-11 1.31	27-9 1.44	28-6 1.56	29-4 1.70
	24.0	12-3 0.19	13-5 0.25	14-6 0.31	15-6 0.38	16-6 0.46	17-4 0.53	18-2 0.61	19-0 0.70	19-10 0.78	20-6 0.88	21-3 0.97	21-11 1.07	22-8 1.17	23-3 1.28	23-11 1.39

NOTES: (1) The required modulus of elasticity, "E", in 1,000,000 pounds per square inch is shown below each span in feet and inches. (2) For plastered ceilings, provided the total dead load does not exceed 15 psf., the required "E" value is 50% greater than the tabular value shown below each span. (3) Spacing of rafters may be limited by allowable span of ceiling materials or fire resistive rating unless 2" x 2" stripping is used at the required spacing. (4) For "F_b" and "E" values for lumber see Table No. 48-B or National Design Specification. Increases in F_b values for duration of load per Section 91.2504(c)4 may be applicable.

TABLE NO. 48-L-3 — LOW SLOPE RAFTERS
Slope 3 in 12 or less — 20 Lbs. Per Sq. Ft. Live Load
No Ceiling Supported — Dry Conditions of Use

DESIGN CRITERIA:

Strength — 10 lbs. per sq. ft. dead load plus 20 lbs. per sq. ft. live load determines required fiber stress.

Deflection — For 20 lbs. per sq. ft. live load. Limited to span in inches divided by 240.

RAFTERS: Spans are measured along the horizontal projection and loads are considered as applied on the horizontal projection.

RAFTER SIZE SPACING (IN)		Allowable Extreme Fiber Stress in Bending, "F _b " (psi).														
		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
2x6	12.0	9-2 0.33	10-0 0.44	10-10 0.55	11-7 0.67	12-4 0.80	13-0 0.94	13-7 1.09	14-2 1.24	14-9 1.40	15-4 1.56	15-11 1.73	16-5 1.91	16-11 2.09	17-5 2.28	17-10 2.47
		7-11 0.29	8-8 0.38	9-5 0.48	10-0 0.58	10-8 0.70	11-3 0.82	11-9 0.94	12-4 1.07	12-10 1.21	13-3 1.35	13-9 1.50	14-2 1.65	14-8 1.81	15-1 1.97	15-6 2.14
	24.0	6-6 0.24	7-1 0.31	7-8 0.39	8-2 0.48	8-8 0.57	9-2 0.67	9-7 0.77	10-0 0.88	10-5 0.99	11-0 1.10	11-3 1.22	11-7 1.35	11-11 1.48	12-4 1.61	12-8 1.75
2x8	12.0	12-1 0.33	13-3 0.44	14-4 0.55	15-3 0.67	16-3 0.80	17-1 0.94	17-11 1.09	18-9 1.24	19-6 1.40	20-3 1.56	20-11 1.73	21-7 1.91	22-3 2.09	22-11 2.28	23-7 2.47
		10-6 0.29	11-6 0.38	12-5 0.48	13-3 0.58	14-0 0.70	14-10 0.82	15-6 0.94	16-3 1.07	16-10 1.21	17-6 1.35	18-2 1.50	18-9 1.65	19-4 1.81	19-10 1.97	20-5 2.14
	24.0	8-7 0.24	9-4 0.31	10-1 0.39	10-10 0.48	11-6 0.57	12-1 0.67	12-8 0.77	13-3 0.88	13-9 0.99	14-4 1.10	14-10 1.22	15-3 1.35	15-9 1.48	16-3 1.61	16-8 1.75
2x10	12.0	15-5 0.33	16-11 0.44	18-3 0.55	19-6 0.67	20-8 0.80	21-10 0.94	22-10 1.09	23-11 1.24	24-10 1.40	25-10 1.56	26-8 1.73	27-7 1.91	28-5 2.09	29-3 2.28	30-1 2.47
		13-4 0.29	14-8 0.38	15-10 0.48	16-11 0.58	17-11 0.70	18-11 0.82	19-10 0.94	20-8 1.07	21-6 1.21	22-4 1.35	23-2 1.50	23-11 1.65	24-7 1.81	25-4 1.97	26-0 2.14
	24.0	10-11 0.24	11-11 0.31	12-11 0.39	13-9 0.48	14-8 0.57	15-5 0.67	16-2 0.77	16-11 0.88	17-7 0.99	18-3 1.10	18-11 1.22	19-6 1.35	20-1 1.48	20-8 1.61	21-3 1.75
2x12	12.0	18-9 0.33	20-6 0.44	22-2 0.55	23-9 0.67	25-2 0.80	26-6 0.94	27-10 1.09	28-1 1.24	30-3 1.40	31-4 1.56	32-6 1.73	33-6 1.91	34-7 2.09	35-7 2.28	36-7 2.47
		16-3 0.29	17-9 0.38	19-3 0.48	20-6 0.58	21-9 0.70	23-0 0.82	24-1 0.94	25-2 1.07	26-2 1.21	27-2 1.35	28-2 1.50	29-1 1.65	29-11 1.81	30-10 1.97	31-8 2.14
	24.0	13-3 0.24	14-6 0.31	15-8 0.39	16-9 0.48	17-9 0.57	18-9 0.67	19-8 0.77	20-6 0.88	21-5 0.99	22-2 1.10	23-0 1.22	23-9 1.35	24-5 1.48	25-2 1.61	25-10 1.75

NOTES: (1) The required modulus of elasticity, "E", in 1,000,000 pounds per square inch is shown below each span, in feet and inches. (2) For "F_b" and "E" values for lumber see Table No. 48-B or National Design Specification. Increases in F_b values for duration of load per Section 91.2504(c)4 may be applicable.

TABLE NO. 48-L-5 — HIGH SLOPE RAFTERS
Slope over 3 in 12 — 20 Lbs. Per Sq. Ft. Live Load
Heavy Roof Covering — No Ceiling Supported
Dry Conditions of Use

DESIGN CRITERIA:

Strength — 15 lbs. per sq. ft. dead load plus 20 lbs per sq. ft. live load determines required fiber stress.

Deflection — For 20 lbs. per sq. ft. live load. Limited to span in inches divided by 180.
 RAFTERS: Spans are measured along the horizontal projection and loads are considered as applied on the horizontal projection.

RAFTER SIZE SPACING (IN)		Allowable Extreme Fiber Stress in Bending, "F _b " (psi).														
		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
2x4	5-5	5-11	6-5	6-10	7-3	7-8	8-0	8-4	8-8	9-0	9-4	9-8	9-11	10-3	10-6	
	12.0	0.20	0.26	0.33	0.40	0.48	0.56	0.65	0.74	0.83	0.93	1.03	1.14	1.24	1.36	1.47
	4-8	5-1	5-6	5-11	6-3	6-7	6-11	7-3	7-6	7-10	8-1	8-4	8-7	8-10	9-1	
	16.0	0.17	0.23	0.28	0.35	0.41	0.49	0.56	0.64	0.72	0.80	0.89	0.98	1.08	1.17	1.27
2x6	3-10	4-2	4-6	4-10	5-1	5-5	5-8	5-11	6-2	6-5	6-7	6-10	7-0	7-3	7-5	7-5
	24.0	0.14	0.18	0.23	0.28	0.34	0.40	0.46	0.52	0.59	0.66	0.73	0.80	0.88	0.96	1.04
	8-6	9-4	10-0	10-9	11-5	12-0	12-7	13-2	13-8	14-2	14-8	15-2	15-8	16-1	16-7	16-7
	12.0	0.20	0.26	0.33	0.40	0.48	0.56	0.65	0.74	0.83	0.93	1.03	1.14	1.24	1.36	1.47
2x8	7-4	8-1	8-8	9-4	9-10	10-5	10-11	11-5	11-10	12-4	12-9	13-2	13-7	13-11	14-4	14-4
	16.0	0.17	0.23	0.28	0.35	0.41	0.49	0.56	0.64	0.72	0.80	0.89	0.98	1.08	1.17	1.27
	6-0	6-7	7-1	7-7	8-1	8-6	8-11	9-4	9-8	10-0	10-5	10-9	11-1	11-5	11-8	11-8
	24.0	0.14	0.18	0.23	0.28	0.34	0.40	0.46	0.52	0.59	0.66	0.73	0.80	0.88	0.96	1.04
2x10	11-2	12-3	13-3	14-2	15-0	15-10	16-7	17-4	18-0	18-9	19-5	20-0	20-8	21-3	21-10	21-10
	12.0	0.20	0.26	0.33	0.40	0.48	0.56	0.65	0.74	0.83	0.93	1.03	1.14	1.24	1.36	1.47
	9-8	10-7	11-6	12-3	13-0	13-8	14-4	15-0	15-7	16-3	16-9	17-4	17-10	18-5	18-11	18-11
	16.0	0.17	0.23	0.28	0.35	0.41	0.49	0.56	0.64	0.72	0.80	0.89	0.98	1.08	1.17	1.27
2x12	7-11	8-8	9-4	10-0	10-7	11-2	11-9	12-3	12-9	13-3	13-8	14-2	14-7	15-0	15-5	15-5
	24.0	0.14	0.18	0.23	0.28	0.34	0.40	0.46	0.52	0.59	0.66	0.73	0.80	0.88	0.96	1.04
	14-3	15-8	16-11	18-1	19-2	20-2	21-2	22-1	23-0	23-11	24-8	25-6	26-4	27-1	27-10	27-10
	12.0	0.20	0.26	0.33	0.40	0.48	0.56	0.65	0.74	0.83	0.93	1.03	1.14	1.24	1.36	1.47
2x16	12-4	13-6	14-8	15-8	16-7	17-6	18-4	19-2	19-11	20-8	21-5	22-1	22-10	23-5	24-1	24-1
	16.0	0.17	0.23	0.28	0.35	0.41	0.49	0.56	0.64	0.72	0.80	0.89	0.98	1.08	1.17	1.27
	10-1	11-1	11-11	12-9	13-6	14-3	15-0	15-8	16-3	16-11	17-6	18-1	18-7	19-2	19-8	19-8
	24.0	0.14	0.18	0.23	0.28	0.34	0.40	0.46	0.52	0.59	0.66	0.73	0.80	0.88	0.96	1.04

NOTES: (1) The required modulus of elasticity, "E", in 1,000,000 pounds per square inch is shown below each span in feet and inches. (2) For "F_b" and "E" values for lumber see Table No. 48-B or National Design Specification. Increases in F_b values for duration of load per Section 91.2504(c)4 may be applicable.

TABLE NO. 48-L-7—HIGH SLOPE RAFTERS
Slope over 3 in 12 — 20 Lbs. Per Sq. Ft. Live Load
Light Roof Covering — No Ceiling Supported
Dry Conditions of Use

DESIGN CRITERIA:

Strength — 7 lbs. per sq. ft. dead load plus 20 lbs. per sq. ft. live load determines required fiber stress.

Deflection — For 20 lbs. per sq. ft. live load, Limited to span in inches divided by 180.

RAFTERS: Spans are measured along the horizontal projection and loads are considered as applied on the horizontal projection.

RAFTER SIZE SPACING (IN)		Allowable Extreme Fiber Stress in Bending, "F _b " (psi).															
		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	
2x4	12.0	6-2	6-9	7-3	7-9	8-3	8-8	9-1	9-6	9-11	10-3	10-8	11-0	11-4	11-8	12-0	
		0.29	0.38	0.49	0.59	0.71	0.83	0.96	1.09	1.23	1.37	1.52	1.68	1.84	2.00	2.17	
	16.0	5-4	5-10	6-4	6-9	7-2	7-6	7-11	8-3	8-7	8-11	9-3	9-6	9-10	10-1	10-6	
		0.25	0.33	0.42	0.51	0.61	0.72	0.83	0.94	1.06	1.19	1.32	1.45	1.59	1.73	1.88	
2x6	24.0	4-4	4-9	5-2	5-6	5-10	6-2	6-5	6-9	7-0	7-3	7-6	7-9	8-0	8-3	8-6	
		0.21	0.27	0.34	0.42	0.50	0.59	0.68	0.77	0.87	0.97	1.08	1.19	1.30	1.41	1.53	
	12.0	9-8	10-7	11-5	12-3	13-0	13-8	14-4	15-0	15-7	16-2	16-9	17-3	17-10	18-4	18-10	
		0.29	0.38	0.49	0.59	0.71	0.83	0.96	1.09	1.23	1.37	1.52	1.68	1.84	2.00	2.17	
2x8	16.0	8-4	9-2	9-11	10-7	11-3	11-10	12-5	13-0	13-6	14-0	14-6	15-0	15-5	15-11	16-4	
		0.25	0.33	0.42	0.51	0.61	0.72	0.83	0.94	1.06	1.19	1.32	1.45	1.59	1.73	1.88	
	24.0	6-10	7-6	8-1	8-8	9-2	9-8	10-2	10-7	11-0	11-5	11-10	12-3	12-7	13-0	13-4	
		0.21	0.27	0.34	0.42	0.50	0.59	0.68	0.77	0.87	0.97	1.08	1.19	1.30	1.41	1.53	
2x10	12.0	12-9	13-11	15-1	16-1	17-1	18-0	18-11	19-9	20-6	21-4	22-1	22-9	23-6	24-2	24-10	
		0.29	0.38	0.49	0.59	0.71	0.83	0.96	1.09	1.23	1.37	1.52	1.68	1.84	2.00	2.17	
	16.0	11-0	12-1	13-1	13-11	14-10	15-7	16-4	17-1	17-9	18-5	19-1	19-9	20-4	20-11	21-6	
		0.25	0.33	0.42	0.51	0.61	0.72	0.83	0.94	1.06	1.19	1.32	1.45	1.59	1.73	1.88	
2x12	24.0	9-0	9-10	10-8	11-5	12-1	12-9	13-4	13-11	14-6	15-1	15-7	16-1	16-7	17-1	17-7	
		0.21	0.27	0.34	0.42	0.50	0.59	0.68	0.77	0.87	0.97	1.08	1.19	1.30	1.41	1.53	
	12.0	16-3	17-10	19-3	20-7	21-10	23-0	24-1	25-2	26-2	27-2	28-2	29-1	30-0	30-10	31-8	
		0.29	0.38	0.49	0.59	0.71	0.83	0.96	1.09	1.23	1.37	1.52	1.68	1.84	2.00	2.17	
2x14	16.0	14-1	15-5	16-8	17-10	18-11	19-11	20-10	21-10	22-8	23-7	24-5	25-2	25-11	26-8	27-5	
		0.25	0.33	0.42	0.51	0.61	0.72	0.83	0.94	1.06	1.19	1.32	1.45	1.59	1.73	1.88	
	24.0	11-6	12-7	13-7	14-6	15-5	16-3	17-1	17-10	18-6	19-3	19-11	20-7	21-2	21-10	22-5	
		0.21	0.27	0.34	0.42	0.50	0.59	0.68	0.77	0.87	0.97	1.08	1.19	1.30	1.41	1.53	

NOTES: (1) The required modulus of elasticity, "E", in 1,000,000 pounds per square inch is shown below each span in feet and inches. (2) For "F_b" and "F_v" values for lumber see Table No. 48-B or National Design Specification. Increases in F_b values for duration of load per Section 91.2504(c)4 may be applicable.

TABLE NO. 48-N — PROPERTIES FOR TWO-INCH TONGUE-AND-GROOVE DECKING⁽¹⁾

SPAN (In Feet)	LIVE LOAD	DEFLECTION LIMIT	F _b (p.s.i.)	E (p.s.i.)
ROOFS				
4	20	1/240	160	170,000
4.5			200	242,000
5			250	332,000
5.5			300	442,000
6			360	575,000
6.5			420	595,000
7			490	910,000
7.5			560	1,125,000
8			640	1,360,000
FLOORS				
4	40	1/360	840	1,000,000
4.5			950	1,300,000
5			1060	1,600,000

NOTES:

- (1) Spans are based on simple beam action with 10 pounds per square foot dead load and provisions for a 300-pound concentrated load on a 12-inch width of floor decking. Random lay-up permitted in accordance with the provisions of 91.4810(g). Lumber thickness assumed at 1½ inches, net.
- (2) For a deflection limit of 1/360, the required "E" values are 50% greater than the tabular values. For a 1/180 limit, reduce the tabular "E" values by 25%.

TABLE NO. 48-O — REPEALED**TABLE NO. 48-P—MAXIMUM EXPOSURE TO WEATHER—WOOD SHINGLES AND SHAKES (1)**

WOOD SHINGLES				
PITCH OF ROOF		SHINGLE LENGTH		
RISE	RUN	16-INCH	18-INCH	24-INCH
3" to less than 4"	12"	3 ¾"	4 ¼"	5 ¾"
4" or more	12"	5"	5 ½"	7 ½"
TAPERED WOOD SHAKES				
EXPOSURE TO WEATHER		LENGTH OF SHAKE		
7 ½"		18"		
10"		24"		
13"		32"		
STRAIGHT-SPLIT WOOD SHAKES				
5 ½"		18"		
7 ½"		24"		

TABLE NO. 48-Q — (Repealed)

sheathing. This shall not apply where the exterior wall covering is exterior grade plywood with approved water-repellent joints.

A stucco foundation weep screed of not less than 26-gage corrosion-resistant metal shall be provided at the foundation plate line of all exterior stucco walls which are constructed on concrete slab floors at grade. The screed shall provide a minimum 2" lap of the building paper.

RULE OF GENERAL APPLICATION #31-69 APPLIES. SEE APPENDIX LISTING.

(c) **Wood Shingles.** 1. All wood shingles for roofs shall conform to Commercial Standard CS 31 of the U. S. Department of Commerce, and shall bear the label of an approved inspection bureau or agency guaranteeing compliance with Commercial Standard CS 31.

2. All wood shingles shall be laid with a side lap of at least $1\frac{1}{2}$ inches in adjacent courses and $\frac{1}{2}$ -inch in alternate courses with at least two courses of solid wood protecting each side joint. Spacing between shingles shall be not less than $\frac{1}{4}$ -inch nor more than $\frac{3}{8}$ -inch.

3. Every wood shingle shall be nailed to the sheathing with two No. 14 gage hot dipped galvanized, hot dipped zinc, cadmium plated, aluminum or copper nails penetrating into the sheathing at least $\frac{3}{4}$ inch.

4. The exposure to the weather of wood shingle roofs shall not exceed the amount listed in Table No. 48-P.

5. Shingles shall not be installed on a roof having a slope less than four inches to 12 inches and when laid on spaced sheathing shall be installed perpendicular to the sheathing boards.

EXCEPTION: Roofing of porches, attached garages or roofing over clipped ceilings having an area not exceeding 20% of the total roof area may have a slope of not less than three inches to 12 inches. The shingles may be applied without any underlay.

6. Hip and ridge shingles shall be laid with a staggered joint pattern and with an exposure not greater than permitted for shingles in the field of the roof.

7. Sheathing boards shall be spaced not to exceed six inches clear nor more than the width of the sheathing board. Sheathing boards shall be of minimum one inch by four inches nominal size.

(d) Wood Shakes. 1. All wood shakes for roofs shall bear the label of an approved inspection bureau or agency guaranteeing compliance with the following grade regulations:

(i) All shakes shall be 100 percent heartwood, free of bark and sapwood. Shakes shall be 100 percent clear, graded from the split face in the case of hand-split-and-resawn shakes and from the best face in the case of tapersplit and straight-split. Tapersplit shakes and straight-split shakes shall be 100 percent edge-grain; hand-split-and-resawn shakes may include not to exceed 10 percent of flat grain in the lineal inches of any bundle. In case of reinspection, 10 or more bundles selected at random shall constitute a fair sampling of the shipment. Shakes shall be adjudged off-grade, if the total lineal inches of defective shakes exceed seven percent of the total lineal inches to the reinspected sampling.

(ii) The nominal length of shakes shall be 15 inches, 18 inches, 24 inches, or 32 inches, within a minus tolerance of $\frac{1}{8}$ -inch. A variation, including shims and feathertips, of one inch from these nominal lengths of 15 inches, 18 inches, 24 inches, and 32 inches shall be permitted in 5% of the lineal inches of shakes in any bundle. Curvatures in the sawed face of handsplit-and-resawn shakes shall not exceed one inch from the level plane in the length of the shake.

Excessive grain sweeps on the split face shall not be permitted. Edges of shakes shall be parallel within one inch.

(iii) Shake thickness shall be determined by measurement of the area within $\frac{1}{2}$ inch from each edge. If corrugations or valleys exceed $\frac{1}{4}$ inch in depth, a minus tolerance of $\frac{1}{4}$ inch is permitted in the minimum specified thickness. In no case, however, shall the thickness be less than $\frac{1}{4}$ inch in any area of the shake to be exposed after installation except in the area within $\frac{1}{2}$ inch of each edge. Shakes shall be of random widths, none

narrower than four inches. Handsplit-and-resawn shakes shall have a maximum width of 14 inches.

2. The length and exposure to the weather of wood shakes shall be as listed in Table No. 48-P.

EXCEPTION: 15-inch shakes, or wood shingles, may be used for the bottom layer of the double starter course at eaves and 15-inch shakes may be used for the finish course at the ridge.

3. Starting at the eaves with a double starter course, shakes shall be laid in straight or staggered courses with 18-inch wide strips of 30-pound (minimum) saturated felt shingled in between each course in such a manner that no felt is exposed to the weather. Shakes shall be spaced not to exceed $\frac{1}{2}$ -inch and shall lap the joint in adjacent courses not less than $1\frac{1}{2}$ -inches.

4. Every wood shake shall be nailed to the sheathing with at least two 7/32-inch headed hot dipped galvanized, hot dipped zinc, cadmium plated, aluminum or copper nails, penetrating into the sheathing at least $\frac{1}{4}$ inch.

5. Hips and ridges shall be laid to a modified Boston pattern over a double thickness of 30-pound (minimum) saturated felt, and at the same or less exposure of the shakes to that used in the field of the roof.

6. Valley shakes cut parallel to the valley shall be kept two inches on either side of the valley splash rib.

7. Shakes shall not be installed on a roof having a slope less than four inches to 12 inches and when laid on spaced sheathing shall be installed perpendicular to the sheathing board.

EXCEPTION: Roofs of porches, attached garages, or roofs over clipped ceilings having an area not exceeding 20% of the total roof area may have a slope not less than three inches to 12 inches. The 18-inch wide 30-pound saturated felt strips shall be installed as described in Subsection 91.4813 (d) 3.

8. Sheathing boards shall be spaced not to exceed six inches clear nor more than the width of the sheathing board. Sheathing boards shall be of minimum one-inch by four-inch nominal size.

(e) **Asphalt Shingle Roofs.** Asphalt shingle roofs shall be applied as specified in Section 91.3202.

(f) **Composition Roofs.** Composition roofs shall be applied as specified in Section 91.3202.

(g) **Roof Pitch.** Every tile roof shall have a minimum pitch of four inches to 12 inches unless a built-up composition roof is provided beneath the tile.

(h) **Flashing.** Corrosion-resistant metal flashing not thinner than No. 28 gage shall be installed according to the following requirements:

1. Metal valleys shall be made from stock at least 18 inches in width for shingles and 24 inches in width for shakes with a splash rib at least $\frac{1}{4}$ -inch in height for shingles and one inch in height where shakes are used. Sections of flashing shall have an end lap of not less than four inches. Valleys in asphalt shingle roofs may be flashed with two thicknesses of 85-pound roofing at least 18 inches wide.

2. Intersections of chimneys or pipes with roofing shall be made waterproof with flashing and counter-flashing. The center of all flashing for vent pipes, heater pipes, electrical service

connections or similar installations shall be not less than 12 inches from the center of any valley.

At the sides and bottoms of the flashing base there shall be a minimum clear base extension of 4 inches from the juncture of the riser and base to the edge of the base. At the top of the flashing base, the clear base extension shall be not less than 4 inches for composition roofs and for wood shingle or shake roofs the clear extension shall be $1\frac{1}{2}$ times the maximum shingle or shake exposure.

3. Intersection of roof surfaces with walls shall be made waterproof with flashing.

4. Every opening in any exterior wall shall be flashed with sheet metal or waterproof building paper. The flashing shall extend at least three inches under the building paper behind the wall covering and shall be of one piece for the full length of the top and sides of the frame. Side flashing shall be turned over the top of the sill at least $\frac{1}{4}$ inch.

EXCEPTION: Metal frames with two-inch metal surrounds are permissible, provided all joints are welded, soldered, or lapped so as to form a waterproof joint, and the lip under the sill extends out over the building paper not less than $1\frac{1}{4}$ inches.

5. Intersection of chimney and exterior walls not integrally constructed shall be flashed and made waterproof.

(j) **Tile.** Every tile roof shall have two layers of 14-pound asphalt-saturated felt underlay or one layer of 30-pound asphalt-saturated felt underlay. The layers of felt shall be mopped between and on top with asphalt weighing not less than 20 pounds per 100 square feet.

All types of roof tile including shingle type, flat or interlocking, shall be fastened in place with corrosion-resistant nails or wire not smaller than No. 14 gage or by other approved device. All nails shall penetrate the sheathing at least $\frac{1}{4}$ inch. The connection device shall be capable of resisting a force equal to four times the weight of the tile applied in any direction.

Interlocking roof tile having anchor lugs on bottom of tile shall be held in position by means of a one-inch by two-inch stripping nailed to the roof sheathing over the underlay and nailed or fastened in place as required for all types of roof tile.

No roof tile shall absorb, during immersion in water for a period of 48 hours, an amount of water weighing in excess of 15% of the weight of the dry tile.

EXCEPTION: Flat tile on roofs whose slope is less than one vertical to 12 horizontal may be cemented in place with mortar or mastic.

(k) **Metal Roofs.** Corrosion-resistant iron or nonferrous metals used for roof covering shall be not less in thickness than No. 26 gage unless supported by a structural membrane.

(l) **Other Roofs.** The Department may approve any other type of roof covering if it finds that such roof covering is equal in durability, strength and weather resistance to any of the types specified in this Section.

SEC. 91.4814 — WALL FRAMING AND COLUMNS

(a) **Material and Size.** Lumber for wall framing and columns shall be of the species and grades listed in Table No. 48-B or the National Design Specification.

Studs in exterior walls and bearing partitions of buildings not

more than two stories in height shall be not less than 2 inches by 4 inches in size. Studs more than six feet in height shall be not less than 3 inches by 4 inches or 2 inches by 6 inches where supporting loads from two stories above. Nonbearing partitions may be framed with 2-inch by 3-inch studs.

(b) **Height.** When supported laterally as specified in Subsection (e), the maximum allowable height for studs shall be 10 feet for 2-inch by 3-inch studs; 14 feet for 2-inch by 4-inch and 3-inch by 4-inch studs; and 20 feet for 2-inch by 6-inch studs.

When utility grade studs are used the maximum allowable height shall be 8 feet for load-bearing and exterior wall studs and 10 feet for interior nonload-bearing studs. When used in bearing walls, utility studs shall support not more than a roof and ceiling load.

(c) **Spacing.** Studs supporting floors shall be spaced not more than 16 inches. Two by 4 studs, of other than utility grade, not more than 10 feet in length may be spaced not more than 24 inches on center when supporting only a ceiling and roof and utility grade studs shall not exceed 16 inch centers. The spacing of 2-inch by 4-inch studs in nonbearing walls shall not exceed 24 inches and 2-inch by 3-inch studs shall not exceed 16 inches.

When bearing studs are spaced at 24-inch intervals, care shall be exercised to insure centering of roof trusses over studs or, in lieu thereof, solid blocking equal in size to the studs shall be installed to reinforce the double plate above.

(d) **Framing details.** Studs shall be placed with their wide dimension perpendicular to the wall. Not less than three studs shall be installed at every corner of an exterior wall. Studs shall have full bearing on a sill, or a plate, at least 2-inches in thickness and at least as wide as the stud.

Studs shall be capped with double top plates installed to provide overlapping at corners and at intersections with bearing partitions. End joints in double top plates shall be offset at least 48 inches. Interior non-bearing partitions may be capped with a single top plate installed to provide overlapping at intersections with other walls and partitions. The plate shall be tied across joints by solid blocking at least 16 inches in length and equal in size to the plate, or by a $\frac{1}{2}$ " by $1\frac{1}{2}$ " metal tie, with each side of the joint fastened with 2-16d nails.

(e) **Blocking.** Unless covered by interior or exterior wall coverings or sheathings the minimum requirements of this Code, all stud partitions or walls shall have blocking not less than 2 inches in thickness and of the same width as the studs fitted snugly and nailed thereto to provide lateral support to limit the unsupported stud height to least thickness ratio to 50.

(f) **Posts.** Four-inch by four-inch columns of lumber may be used to support loads as follows:

Maximum Unbraced Length of Column (Feet)	Minimum Modulus Elasticity of Lumber (p.s.i.)	Allowable Axial Load (Pounds)
12	1,400,000	3000
8	1,400,000	7000
12	900,000	2000
8	900,000	4500

Columns of greater length or of greater required cross-sectional area shall be designed in accordance with provisions of Division 25.

(g) **Column and Beam Construction.** Where column and beam or girder construction is used, the design shall be in accordance with other provisions of this Code. Positive connections shall be provided from beam or girder to column and from column to floor framing to insure against uplift.

SEC. 91.4814.1 — MASONRY WALLS

(a) **General.** All unit masonry shall be grouted masonry or filled cell masonry constructed with brick, concrete brick or hollow masonry units conforming to the requirements of Division 24 of this Code and to the requirements of this Section.

At the time of laying, all units used in unit masonry shall be free of excess dust and dirt and shall be moist.

When the grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the grout pour $1\frac{1}{2}$ inches minimum below the top of the uppermost units.

All grouted masonry shall be kept moist continuously for at least seven days after being laid.

(b) **Mortar and Grout.** Grout shall be composed by volume of one part portland cement to $3\frac{1}{2}$ parts of sand, and water to produce consistency for pouring without segregation of constituents of the mortar. Lime putty may be added to the mix but not in excess of $\frac{1}{4}$ part of volume of the cement content.

Mortar shall be as specified in Section 91.4806 (c).

(c) **Solid Masonry.** All solid units in the two outer tiers shall be laid with full, unfurrowed bed joints of mortar, and with the head joints filled with sufficient mortar to form dams to retain the grout. All interior joints shall be solidly filled with grout.

One exterior tier may be carried up three courses before grouting, but the other tier shall be carried up not more than one course above the grouting.

All longitudinal, vertical (interior) joints shall be not less than one inch in thickness.

(d) **Hollow Unit Masonry (Filled Cell Construction).** All masonry in filled cell construction shall be built to preserve the unobstructed vertical continuity of the cells to be filled. Cell walls and cross webs forming such cells to be filled shall be full bedded in mortar to prevent leakage of grout, and all joints around such cells shall be struck smooth. All head (or end) joints shall be solidly filled with mortar for a distance in from the face of the wall not less than three inches.

Vertical cells to be filled shall have vertical flues measuring not less than two inches by three inches.

Cleanout openings shall be provided at the bottoms of all cells to be filled at each lift or pour of grout where such lift or pour of grout is in excess of three feet in height. Any overhanging mortar or other obstruction or debris shall be removed from the insides of such cells, and cleanouts sealed before grouting.

All cells containing reinforcement shall be filled solidly with grout. Vertical cells containing reinforcement shall be filled solidly with grout in lifts not exceeding eight feet in height.

All cells under first floor construction shall be filled solidly with mortar or grout.

EXCEPTION: The provisions of this Subsection relative to mortar and grout shall not apply to mortarless masonry construction; provided the nominal wall thickness is not less than eight inches; provided the least clear dimension of any cell to be filled is not less than four inches; provided the cells to be filled are filled with concrete composed by volume

of one part cement, two parts sand, and two parts pea gravel; provided the maximum size aggregate is $\frac{3}{8}$ inch; provided said concrete is well rodded when placed; and provided further that all other requirements of Section 91.4814.1 of this Code are complied with.

(e) **Footings.** Footings shall be constructed as specified in Section 91.4807.

(f) **Footing Reinforcement.** All masonry wall footings shall be reinforced with two $\frac{1}{2}$ -inch bars continuous at center line, one three inches above the bottom and one two inches below the top of the foundation wall.

(g) **Footing Dowels.** For each vertical bar, a dowel shall be embedded in the footing 12 inches and shall lap the vertical bar 24 inches.

(h) **Wall Thickness, Height and Reinforcement.** Walls shall be not less than six inches in thickness. Six-inch walls shall not exceed eight feet, six inches in height between points of support. Eight-inch or thicker walls shall not exceed 10 feet, six inches in height.

Exterior and bearing walls shall be reinforced vertically with $\frac{1}{2}$ -inch bars not more than 24 inches apart.

(i) **Cross Walls and Corners.** The distance between masonry or wood cross walls shall not exceed 12 feet for six-inch walls nor 20 feet for eight-inch walls.

All exterior and bearing walls shall be reinforced with two $\frac{1}{2}$ -inch vertical bars at all corners and at all intersections of masonry cross walls.

Corners of masonry walls shall be bonded by overlapping units in alternate courses with all overlapping cells of hollow units filled solidly with mortar or grout.

Intersections of masonry walls shall be bonded by overlapping units in alternate courses with all overlapping cells of hollow units filled solidly with mortar or grout, or by steel ties not over 16 inches apart vertically. Such steel ties shall be not less than $\frac{1}{4}$ -inch round bars or 3.4-pound metal lath extending into each wall not less than six inches. All metal ties shall be embedded solidly in mortar or grout.

Wood partitions shall have double studs at masonry walls and be bolted to the masonry wall with $\frac{1}{2}$ -inch bolts not farther apart than 24 inches. The top plate of wood partitions abutting masonry walls shall extend six inches onto the masonry wall and be bolted with one $\frac{1}{2}$ -inch bolt to the masonry, or have a standard joist anchor from plate to wall.

(j) **Openings in Walls.** One $\frac{1}{2}$ -inch vertical bar shall be placed at each side of each opening extending 24 inches beyond the opening.

Openings shall not exceed $\frac{2}{3}$ the length of a wall nor shall the width of a single opening exceed eight feet, six inches.

EXCEPTION: Garage front door openings may be eight feet, six inches wide where there is not less than 16 inches of reinforced masonry on each side of such openings and where diagonal bracing corner-to-corner is provided in the plane of the plate line consisting of not less than one-inch by six-inch flatwise in each direction securely fastened to plates and ceiling members.

Vertical members of reinforced masonry whose height is not more than 10 times their least dimension and whose face length horizontally is not less than 12 inches shall be considered in

calculating length of walls and as supporting lintels and bond beams.

(k) **Sill Reinforcement.** Each sill shall have not less than two $\frac{3}{8}$ -inch bars or equivalent extending 24 inches beyond each side of the openings.

(l) **Lintels.** Each lintel having a span not exceeding six feet shall have two $\frac{3}{8}$ -inch bars within four inches of the bottom of 15 inches of masonry courses filled solidly with grout.

Each lintel having a span of over six feet but not exceeding eight feet, six inches shall have two $\frac{3}{8}$ -inch bars within four inches of the top and two $\frac{3}{8}$ -inch bars within four inches of the bottom of 15 inches of masonry courses filled solidly with grout, with a $\frac{3}{8}$ -inch vertical bar tie hooked at each end installed at intervals not exceeding 12 inches.

Horizontal steel shall be placed not more than 2 $\frac{1}{2}$ inches from the outer faces of walls.

(m) **Bond Beams.** A continuous bond beam shall be constructed in all exterior and bearing masonry walls at the roof or ceiling line. The bond beam shall be 15 inches deep of masonry solidly filled with grout. Reinforcement shall be two $\frac{3}{8}$ -inch horizontal bars within four inches of the top and two $\frac{3}{8}$ -inch bars within four inches of the bottom. Bond beam steel shall be lapped 24 inches around corners and in wall intersections. Splices shall be not less than 24 inches in length.

Similar bond beams reinforced with two $\frac{3}{8}$ -inch bars shall be constructed in all interior nonbearing masonry.

In lieu of bond beams in nonbearing masonry walls, wood plates shall be used not less than two inches in thickness and the full width of the wall securely spiked to ceiling or roof construction and bolted to the top of the wall with $\frac{3}{4}$ -inch bolts having not less than six inches embedded in the masonry and not more than 24 inches apart.

Horizontal steel shall be placed not more than 2 $\frac{1}{2}$ inches from the outer faces of walls.

(n) **Plates.** The roof construction shall bear upon wood plates not less than two inches by four inches bolted on top of the walls with $\frac{3}{4}$ -inch bolts having not less than six inches embedded in the masonry at intervals not greater than four feet.

(o) **Ceiling Joists and Roof Rafters.** Ceiling joists or roof rafters shall be anchored with $\frac{3}{8}$ -inch bolts extending through the wood framing into the masonry wall not less than six inches at intervals not exceeding four feet. (These bolts may be used for the required bolts in plates.)

(p) **Wood Floor Supports.** Where wood floor joists are supported by masonry walls, the footing shall be extended up to the plate supporting the joists and shall be four inches thicker than the masonry wall to provide a four-inch shelf for the support of the joists. The plates under the joists shall conform to Section 91.4809(c).

Where the wood floor joists are supported by a wood ledger, the ledger shall be not less than three inches by six inches bolted to the masonry with not less than $\frac{3}{4}$ -inch by eight-inch bolts at 24-inch centers, embedded four inches into masonry.

(q) **Wood Framing.** All wood framing in masonry dwellings and accessory buildings shall conform to all the requirements of this Division for wood framing.

SEC. 91.4815 — FIRESTOPS

(a) **General.** Firestopping shall consist of wood not less than two inches thick, or incombustible materials. Firestopping shall form a complete block across the space to be firestopped.

**TABLE NO. 48-B
ALLOWABLE SPANS FOR LINTELS**

Size of Lintel (Inches)	Minimum lumber properties (psi) for spans shown					
	E = 1,300,000			E = 1,100,000		
	F _b (Single Member)	ALLOWABLE SPANS SUPPORTING:		F _b (Single Member)	ALLOWABLE SPANS SUPPORTING:	
		Floor, Roof & Ceiling	Roof & Ceiling Only		Floor, Roof & Ceiling	Roof & Ceiling Only
4 x 4	650	3'-6"	4'-0"	400	3'-6"	4'-0"
4 x 6	800	5'-6"	6'-0"	550	4'-6"	5'-0"
4 x 8	850	7'-0"	8'-0"	600	6'-6"	7'-0"
4 x 10	950	9'-0"	10'-0"	650	8'-6"	9'-0"
4 x 12 ⁽²⁾	1050	10'-0"	12'-0"	750	9'-0"	10'-0"

DESIGN LOADING: Live load—40 psf. Dead load weight of floor—5 psf plus weight of joists. Weight of lath and plaster—8 psf.

NOTES:

- (1) Tabulated values are for use in residential buildings only.
- (2) 4" x 12" Douglas Fir, No. 1 grade may be used over a 16'-0" garage door opening in one-story attached or detached garages without ceilings.
- (3) For "F_b" and "E" values for lumber see Table No. 48-B or National Design Specification.

(b) **Stud Walls and Partitions.** Enclosed spaces in stud walls, partitions and furred walls shall be fire-stopped at the top and bottom and also at the mid-point in walls more than 10 feet high. The distance between fire-stops in walls and partitions shall not exceed 10 feet measured \rightarrow horizontally or \leftarrow vertically. Top and bottom plates which fill all spaces between studs and furring shall be considered fire-stops.

Where cove ceilings occur, the wall shall be fire-stopped at the base of the cove. Sliding door pockets shall be fire-stopped around the concealed perimeter.

(c) **Stairs.** Enclosed spaces between stair stringers shall be firestopped at each end and at the middle of each flight.

(d) **Chimneys.** All spaces between chimneys and wood framing shall be firestopped with incombustible material at all floor and ceiling levels.

SEC. 91.4816 — LINTELS OVER OPENINGS

(a) **General.** A lintel shall be placed over every opening, three feet or more in width, in any stud bearing wall or bearing partition.

(b) **Lintel Spans.** Lintels shall be of sufficient size to support the actual loads imposed upon them but shall not be smaller than the sizes shown in Table No. 48-R.

(c) **End Bearing.** Each end of a lintel shall have a bearing of not less than 1½ inches by the width of the lintel.

(d) **Supporting Studs.** All openings provided with lintels shall have studs doubled on each side. The outer stud shall extend from the sill to the plate. The inner stud shall extend from the sill to the bottom of the lintel and shall not be cut except to receive window sill plate.

SEC. 91.4817 — BRACING OF STUD WALLS

(a) **General.** Every wood stud exterior wall or bearing partition shall be provided with effective bracing at least equivalent to the bracing specified in this Section.

(b) **One-Story Buildings.** Walls and partitions in one-story buildings shall be braced as specified in this Subsection at each end, or as near the end as possible, and at least every 25 feet of its length. Types of bracing shall be one of the following:

1. Gypsum sheathing or gypsum wallboard not less than $\frac{1}{2}$ -inch thick covering a panel four feet wide;

2. A one-inch by six-inch continuous board extending diagonally from bottom of lowest plate to top of upper plate at an angle sufficient to include four stud spaces;

3. Diagonal sheathing of one-inch nominal boards run at an angle of 45 degrees covering a panel four feet wide. Space between diagonal sheathing boards may not exceed the width of the boards;

4. A panel of plywood sheathing not less than four feet wide constructed to conform to Section 91.2514(c);

5. Two $\frac{1}{8}$ -inch x $1\frac{1}{2}$ -inch steel straps placed diagonally across not less than four stud spaces as a crossed pair of tension braces, nailed with two 8d nails at each end to top and bottom plates and two 8d nails to each intermediate stud;

6. Gypsum lath ($\frac{3}{8}$ "") attached to studs and plates, and plaster ($\frac{1}{2}$ ""), covering a panel four feet wide;

7. Exterior stucco applied over furred or self-furring lath. The minimum panel width shall be not less than four feet;

8. Fiberboard wall sheathing 7/16-inch thick, conforming to Division 25. The minimum panel width shall be not less than four feet.

(c) **Two-Story Buildings.** Walls and partitions in the top story of a two-story building may be braced in accordance with Subsection (b) of this Section.

Walls and partitions in the first story shall have braced wall sections (with studs at 16-inch centers) at each end, or as near the end as possible, and additional sections to provide not less than the following:

1. Twenty-five percent of the linear length of the wall or partition in braced wall sections having a minimum width of four feet when any of the following materials are used:

A. Solid diagonal sheathing of one-inch nominal boards run at an angle of 45 degrees.

B. Plywood sheathing of $\frac{3}{8}$ -inch thickness installed to conform to Section 91.2514(c).

C. Exterior stucco applied over furred or self-furring lath, provided all studs, plates and sills within the wall bracing sections are Douglas Fir or other Group II species shown in Table 13 of the National Design Specification.

2. Fifty percent of the linear length of the wall or partition in braced wall sections having a minimum width of four feet when any of the following materials are used:

A. Gypsum sheathing or Gypsum wallboard not less than $\frac{1}{2}$ -inch thick.

B. Gypsum lath ($\frac{3}{8}$ "") attached to studs and plates covered with plaster ($\frac{1}{2}$ "").

C. Plywood sheathing of 5/16-inch thickness installed to conform to Section 91.2514(c).

D. Fiberboard wall sheathing 7/16-inch thick, conforming to Division 25.

E. Exterior stucco applied over furred or self-furring lath.

3. Equivalent bracing may be provided by proportional amounts of the materials specified in 1 and 2 above.

SEC. 91.4818 — CUTTING AND BORING OF WOOD STUDS

(a) **General.** No wood stud shall be cut, notched or bored except as provided in this Section.

(b) **Cutting and Notching.** In exterior walls and bearing partitions, any wood stud may be cut or notched to a depth not exceeding 25 percent of the width of the stud.

In non-bearing partitions, any wood stud may be cut or notched to a depth not exceeding 40 percent of the width of the stud.

(c) **Bored Holes.** A hole not greater in diameter than 40 percent of the stud width may be bored in any wood stud.

Bored holes not greater than 60 percent of the width of the stud are permitted in non-bearing partitions or in any wall where each bored stud is doubled, provided not more than two such successive doubled studs are so bored.

In no case shall the edge of the bored hole be nearer than $\frac{1}{2}$ -inch to the edge of the stud.

Bored holes shall not be located at the same section of stud as a cut or notch.

(d) **Plates.** Where a double plate is cut, the plate shall be reinforced on each side with a $1\frac{1}{2}$ -inch by $\frac{1}{2}$ -inch metal strap, nailed with four 16d nails on each side of the cut.

SEC. 91.4819 — EXTERIOR COVERINGS

(a) **General.** All exterior walls shall be covered on the outside with weatherboarding, plywood, shingles, plaster, masonry, metal, or other approved material.

(b) **Plastered Walls.** Exterior walls of plaster shall conform to the requirements of Division 47 of this Code.

(c) **Masonry Veneer.** Exterior walls of masonry veneer shall conform to the requirements of Division 29 of this Code.

(d) **Metal.** Exterior walls of metal shall be of corrosion-resistant material.

(e) **Wood.**

1. **General.** Exterior wall coverings of the minimum thickness specified in this Section are based upon a maximum stud spacing of 16 inches unless specifically shown otherwise.

2. **Siding.** Siding shall have a minimum thickness of $\frac{3}{8}$ inch unless placed over sheathing permitted by this Code.

Siding patterns known as rustic, drop siding, or shiplap, shall have an average thickness in place of not less than $\frac{19}{32}$ inch and shall have a minimum thickness of not less than $\frac{3}{8}$ inch. Bevel siding shall have a minimum thickness at the butt section of not less than $\frac{7}{16}$ inch and a tip thickness of not less than $\frac{3}{16}$ inch. Siding of lesser dimensions may be used over sheathing which conforms to this Code.

All weatherboarding or siding shall be securely nailed to each stud with not less than one nail, or to solid 1-inch nominal wood sheathing or $\frac{1}{2}$ -inch plywood sheathing with not less than one line of nails spaced not more than 24 inches on center in each piece of the weatherboarding or siding.

3. **Plywood.** Plywood shall be of the exterior type not less than $\frac{3}{8}$ inch thick. Unless applied over 1-inch wood sheathing or $\frac{1}{2}$ -inch plywood sheathing, joints shall occur over framing members and shall be covered with a continuous wood batt; or joints shall be lapped horizontally or otherwise made waterproof.

Plywood panel siding shall be installed in accordance with Table No. 48-S.

TABLE NO. 48-S — EXPOSED PLYWOOD PANEL SIDING
(Face Grain Parallel to Studs)

Minimum Thickness	Max. Stud Spacing (Inches) Plywood Siding Applied Direct to Studs or Over Sheathing
$\frac{3}{8}$ "	16'
$\frac{1}{2}$ "	24

NOTE:

¹May be 24 inches if plywood siding applied over one of the following:

- (a) 1-inch board sheathing; (b) $\frac{3}{8}$ -inch plywood sheathing with face grain perpendicular to studs; (c) $\frac{1}{2}$ -inch plywood sheathing.

4. **Shingles or shakes.** Wood shingles or shakes and asbestos cement shingles may be used for exterior wall covering, provided the frame of the structure is covered with building paper — 91.4813(b). The thickness of wood shingles or shakes between wood nailing boards shall be not less than $\frac{3}{4}$ inch. Wood shingles or shakes, and asbestos shingles or siding, may be nailed directly to fiberboard nailbase sheathing not less than $\frac{1}{2}$ -inch nominal thickness with annular grooved nails. Fiberboard nailbase sheathing and shingle backer shall comply with ASTM D2277 and ASTM C208, respectively.

5. **Particleboard.** Particleboard shall be of the exterior type 2-B-1 conforming to Commercial Standard CS-236, not less than $\frac{3}{8}$ -inch thick and not less than $\frac{3}{4}$ -inch thick when applied directly to framing spaced 24 inches on center. Unless applied over 1-inch wood sheathing or $\frac{1}{2}$ -inch plywood, sheathing joints shall occur over framing members and shall be covered with a continuous wood batt; or joints shall be lapped horizontally or otherwise made waterproof.

6. **Nailing.** All fasteners used for the attachment of outside coverings shall be of a corrosion-resistant type.

SEC. 91.4820 — INTERIOR PLASTERING

All interior plastering and lathing shall conform to the requirements of Division 47 of this Code.

SEC. 91.4822 — CHIMNEYS

(a) **General.** Every combustion chamber shall be connected to a chimney conforming to the requirements of this Section.

EXCEPTIONS: 1. Appliances may be vented as specified in Article 5, Chapter 9, of the Los Angeles Municipal Code (Heating Code).

2. Factory-built metal chimneys tested in accordance with ANSI A131.1 and listed by an approved testing agency providing periodic in-plant production inspection may be used in conjunction with residential fireplaces.

(b) **Footings.** Every masonry or concrete chimney shall be supported upon concrete footings at least 12 inches thick extending at least six inches beyond the chimney walls, and projecting at least 12 inches below the adjacent undisturbed natural ground surface.

(c) **Walls.** Every chimney shall be constructed of masonry, concrete, or metal conforming to the requirements of this Sub-section.

1. **Masonry.** All materials used in the construction of masonry chimneys shall conform to the requirements of Division 24 of this Article.

Masonry chimneys shall be constructed of the following materials:

- a. Brick (MW Grade);
- b. Concrete brick;
- c. Concrete block;
- d. Cast building stone;
- e. Approved natural stone.

Hollow masonry units of concrete shall be placed with cells vertical and shall have all cells filled solid with grout.

2. **Concrete.** Concrete chimneys shall be of either poured-in-place construction or shall be constructed of precast inner and outer units laid up with a reinforced grouted vertical joint between units. All joints between precast units shall be filled with mortar.

Flue lining may be used as the inner unit. Concrete shall be standard 2000 psi as set forth in Division 26 of this Code.

3. **Veneer.** Veneer units shall be tied or anchored as required by Division 29 of this Article. The required thickness of the chimney wall shall not include the thickness of veneer.

4. **Thickness.** Every masonry or concrete chimney shall have solid walls at least eight inches thick or shall have a flue lining surrounded by a layer of cement grout and concrete or masonry, the total thickness of which shall be not less than four inches outside the flue lining. The layer of grout shall be at least one inch in thickness.

5. **Reinforcement.** Every masonry or concrete chimney shall be reinforced with steel consisting of the following:

a. Vertical reinforcement shall be #4 deformed bars hooked into the footing and spaced at not greater than 24 inches on center around the chimney. In chimneys of 40-inch width or less, four of the vertical bars shall be continuous for the full height of the chimney and be hooked into the chimney cap. Such continuous bars shall be located as near the corners of the chimney as practicable and bends in the bars shall be avoided or minimized. Two additional vertical bars shall extend full height for each additional flue in the chimney or for each additional 40 inches or fraction of chimney width. Bars which are not required to be continuous shall extend from the footing to not less than 36 inches above the level of the smoke shelf.

EXCEPTION: Chimneys constructed of hollow masonry units may have vertical reinforcing bars spliced to footing dowels, provided that called inspections are made in compliance with the requirements of Division 24 of this Article for filled cell construction.

b. #3 horizontal bars as ties looped around vertical bars and spaced at not more than 24 inches apart vertically from footing to chimney cap. A tie shall be provided at each bend in vertical bars.

EXCEPTION: Two ¼-inch bars used as ties may be substituted for each #5 bar.

c. Two ¼-inch round bars looped around vertical steel in chimney cap and bond slabs.

Where units in hollow masonry construction are not bonded by overlapping of successive courses, one vertical ¾-inch dowel shall be used to bond each masonry unit to the course above. This reinforcement shall be in addition to that required above.

6. **Metal chimneys.** Metal chimneys shall be constructed of iron or steel of at least No. 12 gauge in thickness.

Where a metal chimney extends through any ceiling or space above the ceiling of the room in which the inlet is located, it

shall be enclosed either in a masonry or concrete chimney or a vertical shaft conforming to one of the following:

a. **Shaft protection.** A shaft of two-hour fire-resistive construction as set forth in Table No. 43-B of this Article shall be provided and an air space of not less than three inches shall be maintained between the chimney and the shaft. The air space shall be vented at both top and bottom. The shaft shall extend at least six inches above the roof and shall be weather-protected;

b. **Insulated protection.** The metal chimney shall be solidly wrapped with at least $\frac{1}{4}$ -inch of asbestos material and the asbestos shall be surrounded with at least $2\frac{1}{2}$ inches of solidly packed inert filler. The filler shall be protected by an outside lining of metal, wire mesh, or insulating metal foil. Metal foil lining shall be held in place by the wires not smaller than No. 14 gauge and spaced not to exceed 12 inches o.c. both ways. An air space of not less than three inches at any point shall be maintained between the surface of the protection and any adjacent construction. The air space shall be vented at both top and bottom. Top ventilation shall be to the outer air. The chimney protection shall extend at least six inches above the roof and shall be weather-protected.

Metal straps may be used to anchor the metal chimney in place, provided each strap has a length of not less than 12 inches between the metal chimney and any combustible material to which it is attached.

(d) **Caps.** Masonry or concrete chimneys shall be capped with at least four inches of concrete or reinforced masonry.

(e) **Height.** The top of the chimney shall extend two feet or more above all portions of the roof within ten feet of the chimney.

(f) **Flues.** Flue lining shall have a minimum thickness of $\frac{1}{4}$ -inch. The lining shall be either asbestos, cement, terra cotta, or fire clay conforming with the requirements of one of the materials listed in "Tentative Classification of Fire Clay Refractories", A.S.T.M. Designation C27.

No flue shall be smaller in area than $1/10$ the area of the fire-box opening. Where the fireplace is open on more than one side, the fireplace opening shall be measured along the greatest fire-box dimension.

(g) **Separation of Flues.** When more than one flue or vent is contained in the same chimney, at least four inches of solid masonry, including flue linings, shall separate the flues.

(h) **Corbeling.** No chimney shall be corbeled from a wall more than $1/3$ the chimney dimension measured in the direction of the corbel, nor shall a chimney be corbeled from a wall which is less than eight inches in thickness. In no case shall the slope of the corbeling exceed a four-inch projection for each 24 inches in height of the flue lining.

(i) **Clearance.** Masonry or concrete chimneys shall be kept one inch clear of all combustible materials. Metal chimneys shall be kept 12 inches clear of all combustible materials except when enclosed by a shaft or insulated protection.

EXCEPTION: *Masonry or concrete chimneys constructed integrally with the walls of a masonry or concrete building need not be maintained one inch clear from combustible materials.*

(j) **Anchorage.** All masonry and concrete chimneys shall be anchored at each floor or ceiling line more than six feet above grade, except where constructed completely within the exterior walls of the building. Anchorage shall consist of two $3/16$ -inch

by one-inch steel straps cast at least 18 inches into the chimney with a 180-degree bend with a six-inch extension around the vertical reinforcing bars in the outer face of the chimney. Each strap shall be fastened to the structural framework of the building with two $\frac{1}{2}$ -inch bolts per strap. Where the joists do not head into the chimney the anchor straps shall be connected to two-inch by four-inch ties crossing a minimum of four joists. The ties shall be connected to each joist with two 16d nails. Metal chimneys shall be anchored at each roof and ceiling with two $1\frac{1}{2}$ -inch by $\frac{1}{2}$ -inch metal straps looped around the outside of the chimney insulation and nailed with six 8d nails per strap to the roof or ceiling framing.

(k) **Cutting of Plates.** Where plates are cut to permit the passage of the chimney, $3/16$ -inch by one-inch steel strap anchors shall be hooked into the concrete bond beam and secured to the end of each plate with at least two $\frac{1}{2}$ -inch by four-inch lag screws or two $\frac{1}{2}$ -inch bolts.

(l) **Inlets.** Not more than one inlet shall be connected to any flue opening.

(m) **Loads on Chimney.** No chimney shall support any load other than its own weight.

EXCEPTION: Masonry or concrete chimneys constructed integrally with the walls of a masonry or concrete building may support other loads.

(n) **Gas Vents.** A gas vent which meets the requirements of the Section for flues may be installed in a chimney. No gas vent shall be connected to any smoke flue.

(o) **Spark Arresters.** All chimneys shall be provided with a spark arrester made of minimum 12 gage wire mesh with $\frac{1}{2}$ inch maximum openings.

SEC. 91.4823 — FIREPLACES AND BARBECUES

(a) **General.** Every fireplace or barbecue shall conform to the requirements of this Section.

(b) **Hearth.** Every fireplace or barbecue shall be provided with a masonry or concrete hearth extending at least eight inches beyond each side of the firebox opening and at least 20 inches from the face of the chimney. The hearth shall be supported by a reinforced concrete slab cantilevered from the chimney, or by a concrete footing or slab on grade. A reinforced cantilevered masonry or concrete hearth slab shall be at least three inches thick at the outer edge and shall increase uniformly to a thickness of five inches or more at the face of the chimney.

Reinforcement of such a slab shall not be less than $\frac{3}{8}$ -inch round bars spaced six inches on centers perpendicular to the chimney and 12 inches on centers parallel to the chimney face. For slabs projecting more than 20 inches beyond the face of the chimney the slab shall be designed to support the loads prescribed in this Article. Reinforcement shall be placed $1\frac{1}{2}$ inches below the top of the slab.

EXCEPTION: A hearth slab will not be required where the fire pit is depressed at least six inches below the rim of the firebox and the unit is installed at least 30 inches above the floor and designated for cooking purposes only.

(c) **Fireplace Walls.** Firebacks and jambs of masonry shall be not less than eight inches nominal in thickness which may include four inches of firebrick. A firebox will be permitted to be open on all sides.

(d) **Hoods.** Metal hoods used as part of a fireplace or barbecue shall be not less than No. 18 gage in thickness with all seams and connections of smoke-tight unsoldered construction.

The hood shall be sloped at an angle from the vertical of 45 degrees or less and shall extend horizontally at least six inches beyond the limits of the firebox.

(e) **Lintel.** Brick work over the fireplace opening shall be supported by a steel angle not smaller than three inches by 2½ inches by 3/16 inch set with not less than three inches of end bearing on the masonry or by a reinforced masonry or concrete bond beam.

(f) **Smoke Shelf.** All fireplaces shall be constructed in such a way that a line projecting vertically from the flue nearest the face of the firebox shall intersect the top surface of the fireback at least ½ inch to the rear of the inside top edge of the fireback. Smoke shelves may be of masonry, concrete, or metal of at least ¾-inch thickness.

The smoke shelf may be omitted if the chimney is provided with a metal cap designed to prevent a down draft. A barbecue shall not require a smoke shelf where the firebox is located at least 30 inches above the floor and is designated for cooking purposes only.

(g) **Area of throats and damper openings.** The net cross-sectional area of the throat between the firebox and the smoke chamber shall be not less than as required for flues. Where dampers are used, they shall be of not less than No. 12 gage metal. When fully opened, damper openings shall be not less than 90% of the required flue area. When fully opened, damper blades shall not extend beyond the line of the inner-face of the flue.

(h) **Combustible Materials.** No wood or other combustible material shall be within six inches of the fireplace opening.

(i) **Metal Heat Circulators.** Metal heat circulators may be installed in fireplaces.

SEC. 91.4824 — FALSE OR IMITATION FIREPLACES

(a) **Recess Depth.** The maximum depth of the recess of any false fireplace shall be six inches. If a built-in gas heater is provided in the false fireplace, the maximum depth of the recess shall be two inches.

(b) **Mantel.** No mantel or other projection shall be located less than 12 inches above the top of the recess.

(c) **Vents and Flues.** No vent pipe or flue shall be installed within two feet of any fireplace opening.

SEC. 91.4825 — PATIO COVERS

(a) **General.** Patio covers may be detached or attached to other buildings as accessories to Group R or to single dwelling units in Group H Occupancies. Patio covers shall be used only for recreational, outdoor living purposes and not as carports, garages, storage rooms, or habitable rooms.

Patio covers shall not exceed 12 feet in height. Patio covers shall be open on one or more sides for a clear height of not less than 6 feet 8 inches between the floor and the soffit of supporting members. Where two sides are open, such open sides may be partially closed by solid walls which are not more than 30 inches in height above the patio floor and the remaining sides may be totally enclosed. Open sides shall not be covered with

any materials which would obstruct the free passage of light and air.

EXCEPTION: Open sides may be closed with insect screening and readily removable translucent plastic or readily removable transparent flexible plastic screening of not more than 20 mils in thickness.

(b) **Design Loads.** Patio covers shall be designed and constructed to sustain, within the stress limits of this Code, all dead loads plus a minimum vertical live load of 10 pounds per square foot. Such covers shall be designed to resist a minimum horizontal wind load of 10 pounds per square foot. In addition, they shall be designed to support a minimum wind uplift equal to the horizontal wind load acting vertically upward normal to the roof surface, except that for structures not more than 10 feet above grade the uplift may be three-fourths of the horizontal wind load. When enclosed with insect screening or plastic, wind loads shall be applied to the structure, assuming it is fully enclosed.

EXCEPTIONS: 1. If projecting not more than seven feet from the face of the exterior wall of the building no live load or wind uplift design is required.

2. If projecting more than seven feet and if covered with cloth only the frame need be designed for the required live load and wind uplift load.

(c) **Light and ventilation.** Where required windows open into a patio cover, the requirements of Section 91.4911(b) shall apply.

(d) **Footings.** A patio cover may be supported on a concrete slab on grade without footings, provided the slab is not less than 3½ inches thick and further provided that the columns do not support live and dead loads in excess of 750 pounds per column.

DIVISION 49 — HOUSING REQUIREMENTS

SEC. 91.4901 — GENERAL

(a) **Purpose of Division.** The purpose of this Division is to provide minimum requirements for the protection of life, limb, health, property, safety and welfare of the public and of the occupants of residential buildings.

(b) **Scope of Division.** The requirements of this Division are applicable to any and all new or proposed residential building construction or alterations, and to any and all existing residential buildings to the following extent:

1. The provisions of Section 91.4901 and of Section 91.4931 are applicable to all existing residential buildings.

2. In addition to the provisions of Section 91.4901 and 91.4931, only those sections of this Division which contain standards for the elimination of those conditions appearing as subdivisions under the definition of "Residential Building Subject to Repair," as defined herein, are applicable to those buildings determined to be so classified.

3. All sections of this Division are applicable to those buildings determined to be "Substandard Residential Buildings" as defined herein.

(c) **Housing Department Designation.** Pursuant to the provisions of Section 17961 of the State Housing Law of the State of California, the City Council of the City of Los Angeles hereby designates the Department of Building and Safety as the "Housing Department" for the purpose of enforcing the requirements as set forth in Section 17961 of the State Housing Law of the State of California; provided, however, that all rodent, vermin and contagious disease control shall be under the Los Angeles County Department of Health.

(d) **Department Responsibility.** The Department of Building and Safety shall be the responsible department for any alterations or repairs to buildings in the City of Los Angeles. Any order or requirement of the City of Los Angeles concerning alterations or repairs to any building shall be issued by the Department of Building and Safety.

(e) **Department Approval.** The Department of Building and Safety may approve certain deviations from the requirements of this Division concerning substandard residential buildings, provided the items concerned were built in compliance with code or ordinance provisions in effect at the time of construction; and provided, further, that such additional corrections as may be required by the Department, are made so as to insure that the building complies with the intent of this division.

(f) **Multiple and Comparable Use.** In any residential building containing an apartment hotel, every portion used for apartment house purposes shall comply with all the requirements of this Article for apartment houses, and every portion used for hotel purposes shall comply with all the requirements of this Article for hotels.

(g) **Application.** Except as specifically provided for in this Division, all of the other applicable Divisions of Chapter 9 of the Los Angeles Municipal Code shall be complied with in residential building construction, repairs or alterations.

SEC. 91.4902 — DEFINITIONS

For the purpose of this Division, certain terms are defined as follows:

Apartment, same as Dwelling Unit.

Apartment Hotel, a residential building designed or used for both two or more dwelling units and six or more guest rooms or suites of rooms.

Apartment House, a residential building designed or used for three or more dwelling units or a combination of three or more dwelling units and not more than five guest rooms or suites of rooms.

Bachelor Apartment, Same as Efficiency Dwelling Unit.

Cellar, that portion of a building between floor and ceiling which is wholly or partly below grade (as defined in Division 4 of this Code) and so located that the vertical distance from grade to the floor below is equal to or greater than the vertical distance from grade to ceiling.

Community Kitchen, a kitchen in a hotel used individually or collectively by the occupants of the building, but not used commercially to serve a dining room or the public.

Dormitory, a guest room designed, intended or occupied as sleeping quarters by more than two persons. Every 100 square feet of superficial floor area in a dormitory shall be considered as a separate guest room.

Dwelling, any residential building other than an apartment house, hotel or apartment hotel.

Dwelling Unit, a group of two or more rooms, one of which is a kitchen, designed for occupancy by one family for living and sleeping purposes.

Efficiency Dwelling Unit, A room located within an apartment house or apartment hotel used or intended to be used for residential purposes which combines a kitchen and living and sleeping quarters therein, and which complies with the requirements of Section 91.4930.2 of this Code.

Family, an individual or two or more persons related by blood or marriage, or a group of not more than five persons (excluding servants) who need not be related by blood or marriage, living together in a dwelling unit.

Fire Hazard, any building, device, appliance, apparatus, equipment, tank, vehicle, combustible waste, fence, or vegetation which, in the opinion of the Los Angeles Fire Department, is in such a condition as to cause a fire or explosion or provide a ready fuel supply to augment the spread and intensity of fire or explosion arising from any cause.

Guest Room, any habitable room except a kitchen, designed or used for occupancy by one or more persons and not in a dwelling unit.

Hotel, a residential building designed or used for or containing six or more guest rooms or suites of rooms, but not including any institution in which human beings are housed or detained under legal restraint.

Kitchen, any room used, or intended or designed to be used, for cooking or preparing food, except a light housekeeping room.

Light Housekeeping Room, any room which is designed and used both as a sleeping room and for the cooking or preparation of food in conformance with the provisions of Sec. 91.4930.1 of Article 1, Chapter 9.

"May", is permissive.

Nuisance, includes:

1. Any public nuisance known at common law or in equity jurisprudence;

2. Any attractive nuisance which may prove detrimental to children whether in a building, on the premises of a building, or upon an unoccupied lot. This includes any abandoned wells, shafts, basements, or excavations; any structurally unsound fences or structures; or any lumber, trash, fences, debris, or vegetation which may prove a hazard for inquisitive minors;

3. Whatever is dangerous to human life or is detrimental to health;

4. Overcrowding a room with occupants;

5. Insufficient ventilation or illumination;

6. Inadequate or insanitary sewerage or plumbing facilities;

7. Uncleanliness, when so determined by the Health Officer;

8. Whatever renders air, food, or drink unwholesome or detrimental to the health of human beings when so determined by the Health Officer.

Public Hallway, a hallway, corridor, passageway, vestibule, stairway, landing, or platform in an apartment house, hotel, or apartment hotel; but not within any apartment, guest room or suite of rooms.

Residential Building, a building or portion thereof designed or used for human habitation.

Residential Building Subject to Repair. Any residential building of Class "A" or Type I construction or any residential building constructed after August 17, 1923, which conforms to the laws that were in effect at the time it was constructed or altered, but in which any of the following conditions exist to an extent that endangers the life, limb, health, property, safety, or welfare of the public or the occupants thereof:

1. **Structural Unsoundness, including:**

a. Weakened or deteriorated footings.

b. Footings of insufficient size to carry imposed loads with safety.

c. Defective or deteriorated flooring or floor supports.

d. Flooring or floor supports of insufficient size to carry imposed loads with safety.

e. Members of walls, partitions, or other vertical supports that split, lean, list, or buckle due to defective material or deterioration.

f. Members of walls, partitions, or other vertical supports that are of insufficient size to carry imposed loads with safety.

g. Members of ceilings, roofs, ceiling and roof supports, or other horizontal members which sag, split, or buckle due to defective material or deterioration.

h. Members of ceilings, roofs, ceiling and roof supports, or other horizontal members that are of insufficient size to carry imposed loads with safety.

i. Fireplaces or chimneys which list, bulge, or settle, due to defective material or deterioration.

j. Fireplaces or chimneys which are of insufficient size or strength to carry imposed loads with safety.

2. **Improper Materials of Construction**, including all materials except those specifically allowed or approved by this Code:

3. **Fire Hazard**, as defined in this Section.
4. **Nuisance**, as defined in this Section.
5. **Improperly Weatherproofed**, including:
 - a. Crumbling, loose or falling plaster.
 - b. Broken windows or doors.
 - c. Defective or lack of waterproofing for wood frame walls.
 - d. Defective or weathered exterior wall covering due to lack of paint or other approved protective coating.
 - e. Defective or lack of waterproofing for wood frame roofs.
 - f. Broken, split, decayed, or buckled exterior wall or roof covering.
6. **Improper Sanitation and Safety**, including:
 - a. Lack of one bath, lavatory and water closet in a dwelling unit.
 - b. Lack of one bath, lavatory and water closet either serving each ten guest rooms, or serving each 20 guests if housed in less than 10 guest rooms.
 - c. Lack of kitchen sink in the kitchen of a dwelling unit.
 - d. Lack of running water to sink, bath, water closet and lavatory in a dwelling unit.
 - e. Lack of running water in bath, water closet and lavatory serving guest rooms.
 - f. Lack of heating device to provide hot running water for bath and kitchen sink in a dwelling unit.
 - g. Lack of heating device to provide hot running water for the baths serving guest rooms.
 - h. Lack of adequate electric lighting.
 - i. Lack of adequate heating system.
 - j. Damp, wet rooms used for living purposes.
 - k. Infestation with insects, vermin and rodents, when so determined by the Health Officer.
 - l. General dilapidated condition and not maintained as required by this division.
 - m. Unsanitary underfloor area.
 - o. Lack of adequate window area or ventilation, room area, ceiling height or cubic air space.
7. **Lack of, or Defective Fire Protective Equipment**, where required by this division.
8. **Any Building with Yards with do not Comply with Article 2, Chapter 1 of the Municipal Code.**
9. **Any Building of Class "A" or Type 1 Construction which is Occupied by a Residential Occupancy for which it was Not Designed or Intended.**
10. **Any Residential Building which Constitutes a "Dangerous Building,"** as defined in Section 96.101 of the Municipal Code.

Room — Habitable, any enclosed subdivision in a residential building commonly used for living purposes; but not including lobbies, halls, closets, storage space, or water closet, bath, toilet, slop sink, or general utility rooms or service porches.

"Shall", is mandatory.

Substandard Residential Building. Any residential building or building used for residential purposes, not of Class "A" construction, constructed prior to August 17, 1923 or any residential building constructed after August 17, 1923 not of Class "A" or Type I construction and which does not conform to the laws in

effect at the time it was constructed and in either of which instances any of the following conditions exist to an extent that endangers the life, limb, health, property, safety, or welfare of the public and of the occupants thereof:

1. Structural unsoundness, including:

- a. Weakened or deteriorated footings.
- b. Footings of insufficient size to carry imposed loads with safety.
- c. Defective or deteriorated flooring or floor supports.
- d. Flooring or floor supports of insufficient size to carry imposed loads with safety.

e. Members of walls, partitions, or other vertical supports that split, lean, list, or buckle due to defective material or deterioration.

f. Members of walls, partitions, or other vertical supports that are of insufficient size to carry imposed loads with safety.

g. Members of ceilings, roofs, ceiling and roof supports, or other horizontal members which sag, split, or buckle due to defective material or deterioration.

h. Members of ceilings, roofs, ceiling and roof supports, or other horizontal members that are of insufficient size to carry imposed loads with safety.

i. Fireplaces or chimneys which list, bulge, or settle, due to defective material or deterioration.

j. Fireplaces or chimneys which are of insufficient size or strength to carry imposed loads with safety.

2. Improper materials of construction, including all materials except those specifically allowed or approved by this Code.

3. Fire Hazard, as defined in this Section.

4. Nuisance, as defined in this Section.

5. Improperly weatherproofed, including:

- a. Crumbling, loose, or falling plaster.
- b. Broken windows or doors.
- c. Defective or lack of waterproofing for wood frame walls.

d. Defective or weathered exterior wall covering due to lack of paint or other approved protective coating.

e. Defective or lack of waterproofing for wood frame roofs.

f. Broken, split, decayed, or buckled exterior wall or roof covering.

6. Defective wiring, including all wiring, except that which was legally installed in compliance with Article 3, Chapter 9 of the Municipal Code in effect at the time of installation and is still maintained in good condition.

7. Defective plumbing, including all plumbing except that which was legally installed in compliance with Article 4, Chapter 9 of the Municipal Code in effect at the time of installation and is still maintained in good condition.

8. Defective heating and ventilating devices and accessory vents and piping, including all such devices and accessory vents and piping except those which:

a. Were legally installed in compliance with Article 5, Chapter 9 of the Municipal Code in effect at the time of installation and are still maintained in good condition, and

b. Are properly vented as required by this Division.

9. Improper sanitation and safety, including:

- a. Lack of one bath, lavatory and water closet in a dwelling unit.
- b. Lack of one bath, lavatory and water closet either serving each 10 guest rooms, or serving each 20 guests if housed in less than 10 guest rooms.
- c. Lack of kitchen sink in the kitchen of a dwelling unit.
- d. Lack of running water to sink, bath, water closet and lavatory in a dwelling unit.
- e. Lack of running water in bath, water closet and lavatory serving guest rooms.
- f. Lack of heating device to provide hot running water for bath and kitchen sink in a dwelling unit.
- g. Lack of heating device to provide hot running water for the baths serving guest rooms.
- h. Lack of adequate electric lighting.
- i. Lack of an adequate heating system.
- j. Window areas or ventilation less than that required by this Division.
- k. Room areas, ceiling height and cubic air space less than those required by this Division.
- l. Damp, wet rooms used for living purposes.
- m. Infestation with insects, vermin and rodents, when so determined by the Health Officer.
- n. General dilapidated condition and not maintained as required by this Division.
- o. Improperly enclosed or insanitary underfloor area.
- p. Improperly ventilated or reduced height of underfloor area.

10. Exits, including:

- a. All doors, passageways, stairways, and courts which do not comply with the provisions of this Division.
- b. Lack of access to each dwelling unit, guest room, or suite of rooms without passing through some portion of another dwelling unit, guest room or suite of rooms.

11. Lack of, or defective fire protective equipment, where required by this Division.

12. Any building with yards which do not comply with Article 2, Chapter 1 of the Municipal Code.

13. Any building which is occupied by a residential occupancy for which it was not designed nor intended.

14. Any residential building which constitutes a "dangerous building", as defined in Section 96.101 of the Municipal Code.

Superficial Floor Area. All floor area exclusive of that occupied by built-in dressers, clothes presses, or similar fixtures which are built into and are a substantial part of a building, and not readily removable.

Vent Shaft. A court designed or intended for use only to light or ventilate a water closet, bath, toilet, or general utility room, or service porch.

SEC. 91.4903 — BUILDING CONSTRUCTION GENERAL

(a) General. Every residential building shall be constructed in a safe and substantial manner as provided by this Code.

(b) Shelter. Every residential building shall be weather-

proofed as provided for by this Code, so as to provide shelter for the occupants against the elements and to exclude dampness.

(c) **Materials.** The materials used in the construction of residential buildings shall be only those allowed by this Code.

(d) **Protection of Materials.** Organic exterior wall materials and stucco or exterior plaster shall be protected from deterioration or weathering by application of paint or an approved protective equivalent.

(e) **Design.** All footings, walls, floors, ceilings, roofs and other supporting members of residential buildings shall be designed in accordance with the provisions of this Code.

(f) **Fire Protection.** 1. In addition to other requirements of this Article any residential building shall have all construction in the following locations finished with materials approved for one-hour fire-resistive construction.

In any apartment house with more than two families above the first floor, or in any hotel, with more than six guest rooms above the first floor.

(i) The walls, partitions and ceilings of public hallways.

(ii) The soffits of interior unenclosed stairways and stairwells, and combustible stairways in an enclosed shaft.

(iii) The ceilings and the inside face of enclosing walls which separate cellars or basements from the underfloor area.

2. Any apartment house or hotel three or more stories in height shall be of not less than one-hour fire-resistive construction throughout.

EXCEPTION: The one-hour fire resistance required by this provision may be omitted in:

A. Completely sprinklered buildings.

B. Three-story buildings when the first story is unused underfloor space.

C. Non-rated sliding or folding type room dividers, within individual apartments under the following conditions:

I. Full height room dividers shall be incombustible except that plastic not more than 1/16" thick and having a flame spread rating of 25 or less may be used.

II. Room dividers not higher than three-fourths of the ceiling height of the room may be of combustible construction.

(g) **Division Walls.** Division walls shall conform to the requirements of Section 91.0506 (j).

EXCEPTION: Division walls shall completely separate all portions of the building, but need not extend to the outer edge of any balcony or roof which projects 5 feet or less from the exterior wall directly below, provided the soffit is plastered with fire-resistive plaster and protected with mineral wool filler between joists or rafters for a minimum distance of two feet on each side of where the division wall is omitted.

Fire assemblies, as required by Section 91.0506(j), for corridor openings in division walls, shall be equipped with labeled door-holding devices of fail-safe type which will release the doors and allow them to close upon the operation of approved detectors which are activated by products of combustion other than heat.

The location and installation of detectors shall be as approved by the Superintendent of Building and shall be subject to such periodic tests as required to insure proper functioning.

(h) Sound Transmission Control.

1. **General.** In residential buildings airborne sound control shall be provided in walls and floor-ceiling assemblies separating dwelling units, efficiency dwelling units, light housekeeping rooms or guest rooms and between all such residential uses and other spaces used by the public such as interior corridors, interior public areas, service areas or garages. In residential buildings impact sound control shall be provided in floor-ceiling assemblies separating dwelling units, light housekeeping rooms or guest rooms and between all such residential uses and other spaces such as interior corridors, interior public areas or service areas when such other spaces are located above the residential use area.

2. **Airborne Sound Insulation.** Separate partitions and floor-ceiling assemblies shall be constructed with materials in a construction system which has achieved a Sound Transmission Class (STC) rating of not less than 50 (45 if field tested). Where ceilings are not applied directly to the bottom of the floor framing, separation partitions shall extend through the ceiling to the floor above.

Unsealed joints in the perimeter of any separation partition or floor-ceiling assembly and the perimeter of any opening permitted in the separation shall be acoustically sealed with a permanent resilient material approved for this purpose.

Penetrations.

(i) Entrance doors from interior corridors and interconnecting doors between separate units shall have perimeter seals and such assemblies shall have a Sound Transmission Class rating of not less than 26 and such perimeter seals shall be maintained in effective condition.

(ii) Electrical outlet boxes shall be horizontally separated by not less than 24 inches from outlets in the opposite wall surface and back and sides of boxes shall be sealed with one-eighth inch resilient sealant and backed by a minimum of 2-inch thick mineral fiber insulation.

(iii) Plumbing piping systems within the required sound rated partition and floor-ceiling separation shall be isolated from building construction at points of contact with not less than one-fourth inch of approved resilient material. Such piping passing through joist spaces shall be surrounded by approved insulation. Pipe penetrations shall be sealed with approved permanently resilient sealants.

EXCEPTION: Gas piping systems in required sound rated partitions or sound rated floor-ceiling separations need not be insulated.

(iv) Metal ventilating and conditioned air ducts shall be lined.

EXCEPTION: Ducts serving only exitways, kitchen cooking facilities, and bathrooms need not be lined.

All ducts shall be isolated from the structure with at least one-fourth inch of approved resilient material and points of penetration shall be caulked with approved resilient sealant.

Ducts penetrating corridor separation partitions shall be offset from duct penetrations serving other living units by a minimum distance of 10 lineal feet with at least two 90° bends between the duct outlets.

Required unobstructed air spaces around appliance vents shall not be sealed or insulated.

3. **Impact Sound Insulation.** Separation floor-ceiling assemblies shall be constructed with materials in a construction system which has achieved an Impact Insulation Class (IIC) rating of

not less than 50. Floor coverings may be included in the assembly to obtain the required rating and must be retained as a permanent part of the assembly. Such floor coverings may only be replaced with other coverings that provide the required insulation rating.

All rigid conduit, ventilating ducts, plumbing pipes and appliance vents within the sound rated floor-ceiling assembly shall be isolated from the building construction at points of support or contact by means of resilient sleeves, mounts or underlayments.

4. **Test Assemblies.** Field or laboratory tested wall or floor-ceiling designs having STC or IIC rating of 50 or more (45 or more if field tested) as determined by ASTM E90 or E336 and A.S.T.M. E492-73T, "Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine" may be used without additional field testing. Tests may be required by the Department when evidence of compromise separations is noted.

5. **Field Testing and Certification.** Required field testing shall be done under the supervision of an acoustician or organization experienced in the field of acoustical testing and engineering and approved by the Department as a testing agency. Certified test results shall be forwarded to the Department, verifying that minimum sound isolation requirements stated above have been met.

6. **Airborne Sound Insulation Field Tests.** Field tests shall be conducted in accordance with applicable Field Airborne Sound Transmission loss test procedures of ASTM E336. All sound transmitted from the source room to the receiving room shall be considered to be transmitted through the test partition.

7. **Impact Sound Insulation Field Test.** Field tests shall be conducted in accordance with provisions of A.S.T.M. E492-73T, "Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine."

RULE OF GENERAL APPLICATION #2-74 APPLIES. SEE APPENDIX LISTING

SEC. 91.4904 — YARDS AND COURTS

(a) **Yards.** 1. **Required yards.** In any residential, commercial, or industrial zone, every lot occupied by a residential building shall have yards and space between buildings as required by Article 2, Chapter 1 (Comprehensive Zoning Plan) of the Los Angeles Municipal Code, with the additional provision that any yard or space used for light and ventilation requirements of this Division shall have a minimum width of three feet. Every required yard and space shall be open and unobstructed from the ground to the sky except the projections as permitted by Article 2, Chapter 1 of the Los Angeles Municipal Code.

2. **Finished grade.** A yard required for light and ventilation shall have a finished grade at least six inches below the sill of the windows served for the full width of the required yard.

3. **Light wells.** If a yard is excavated to provide required light or ventilation, the light well thereby created shall meet the requirements for a court for the occupancy served.

(b) **Courts.** 1. **Requirements.** When required for light and ventilation for residential buildings, courts shall conform to the requirements as set forth in this Subsection. Every required court shall be open and unobstructed to the sky from a point six inches below the sill of the lowest window served by the court except for projections as permitted for yards.

2. **Dwellings.** A court for a dwelling shall have a width of not less than four feet and shall contain an area of not less than 40 square feet.

TABLE NO. 49-A — MINIMUM WIDTH AND AREA — APARTMENT HOUSE COURTS

HEIGHT IN APARTMENT HOUSE IN STORIES UPWARDS FROM AND INCLUDING THE LOWEST STORY IN WHICH THERE IS AN APARTMENT	MINIMUM WIDTH OF COURT IN EVERY PART	MINIMUM AREA OF COURT IN SQUARE FEET
1 and 2 stories.....	6 feet	75
3 stories.....	7 feet	120
4 stories.....	9 feet	160
5 stories.....	12 feet	250
6 stories.....	16 feet	400
7 stories.....	20 feet	625
8 stories or more.....	24 feet	840

TABLE NO. 49-B — MINIMUM WIDTH AND LENGTH — HOTEL COURTS

HEIGHT OF HOTEL IN STORIES UPWARDS FROM AND INCLUDING THE LOWEST STORY IN WHICH THERE IS A GUEST ROOM OR DORMITORY	MINIMUM WIDTH OF COURT IN EVERY PART	MINIMUM AREA OF COURT IN SQUARE FEET
1 and 2 stories.....	5 feet	45
3 stories.....	7 feet	70
4 stories.....	10 feet	120
5 stories.....	10 feet	160
6 stories.....	12 feet	216
7 stories.....	14 feet	280
8 stories or more.....	16 feet	352

EXCEPTIONS: 1. The minimum area requirements shall not apply to a court bounded on one side by a minimum three-foot yard or a public way, and the minimum width requirement shall not apply to such a court which is not greater in depth than its width.

2. Vent shafts not less than three feet in least dimension.

3. Apartment houses. A court of an apartment house shall have a minimum width and area corresponding to that set forth in the Table No. 49-A.

EXCEPTIONS: 1. the minimum area requirements shall not apply to a court bounded on one side by a minimum three-foot yard or a public way, and the minimum width requirement shall not apply to such a court which is not greater in depth than its width.

2. Vent shafts not less than three feet in least dimension.

4. Hotels. A court for a hotel shall have a minimum width and length corresponding to that set forth in Table No. 49-B.

EXCEPTIONS: 1. The minimum area requirements shall not apply to a court bounded on one side by a minimum three-foot yard or a public way, and the minimum width requirement shall not apply to such a court which is not greater in depth than its width.

2. Vent shafts not less than three feet in least dimension.

5. Construction. Walls, openings, and floor of every court shall conform to the regulations of this Subdivision.

(1) Courts bounded on one or more sides by a public way

or a yard of three feet minimum width shall have walls conforming to the exterior wall requirements of the building.

(ii) Courts not bounded on one or more sides by a public way or a yard three feet minimum width shall have walls, openings, and floor as required for "Inner Court Enclosures" as set forth in Division 17 of this Article.

6. Access. Every court in a residential building shall be provided with adequate access at the bottom to permit admittance for cleaning purposes.

7. Intake. Every court three or more stories in height shall be provided with a horizontal intake of at least five square feet in area located at or near the bottom of the court. The walls, floor, and ceilings of every intake to a court shall be constructed as required for inner court walls but shall be not less than one-hour fire-resistive construction. There shall be no openings through the enclosing walls, ceiling, or floor of the intake.

SEC. 91.4905 — ROOM AREA AND AIR SPACE

(a) Floor Area — Dwelling Units. In every dwelling unit at least one room shall contain not less than 120 square feet of superficial floor area and every other habitable room, except a kitchen or breakfast nook, shall contain not less than ninety square feet of superficial floor area.

Every room which is used for both cooking and living or both living and sleeping purposes shall have not less than one hundred and fifty square feet of superficial floor space.

(b) Floor Area — Kitchen. Every kitchen in a dwelling unit, and every community kitchen shall contain not less than 50 square feet of superficial floor area. In a hotel every kitchen, other than a community kitchen, or not in a dwelling unit shall comply with all the requirements of Section 91.0508 of this Code for food establishments.

(c) Floor Area — Guest Rooms. Every guest room shall contain not less than ninety square feet of superficial floor area. However, the superficial floor area in the room may be not less than 70 square feet cubic air space notwithstanding, if:

1. The aggregate window area in the room is not less than 16 square feet;

2. The room is occupied or designed for occupancy by not more than one person.

(d) Air Space for Sleeping Rooms. Where more than 2 persons occupy a room used for sleeping purposes the required superficial floor area shall be increased at the rate of fifty square feet for each occupant in excess of two.

(e) Dormitories. No dormitory shall contain sleeping accommodations for more than 20 persons.

(f) Subdivision of Rooms. No portion of any room in any dwelling, apartment house, or hotel shall be enclosed or subdivided, wholly or in part, by a curtain, portiere, fixed or movable partition, or other contrivance or device so as to reduce the area or width below that required by this Section.

(g) Recess from Rooms, Closets, Etc. Every closet, recess from a room, or dressing room over 25 square feet in superficial floor area in an apartment house, or hotel shall be classified as a habitable room and shall comply with all requirements of this Code for such classification.

SEC. 91.4906 — ROOM WIDTHS

(a) **General.** The minimum width of every habitable room, except a kitchen, shall be not less than seven feet at any point within that portion of the room included in any computation of the minimum allowable floor area of the room.

(b) **Water Closet and Shower Compartment.** Every water closet compartment shall be at least 30 inches in clear width. Every shower compartment shall have interior dimensions as required by Article 4 of Chapter 9 (Plumbing Code) of the Los Angeles Municipal Code.

(c) **Openings Between Rooms.** Every kitchen shall be separated from any room used for sleeping purposes by a full partition. Any opening in the partition shall be provided with a full tight-fitting door; provided, however, that one opening of any shape not exceeding 21 square feet in area will be allowed without doors.

For the purpose of determining light, ventilation, and area requirements, a kitchen may be considered as a portion of an adjoining room, provided $\frac{1}{2}$ the area of one common wall is completely open and unobstructed and, provided further, that the total area of such open portions is not less than 25 square feet. The area of such open portions need not exceed 49 square feet, regardless of the area of the common wall.

SEC. 91.4907 — CEILING HEIGHTS

(a) **General.** Every habitable room shall have a ceiling height of not less than seven feet, six inches measured from the finished floor to the finished ceiling.

(b) **Miscellaneous Rooms.** Every general utility, storage or laundry room shall have a ceiling height of not less than seven feet, six inches, measured from the finished floor to the finished ceiling.

Every water closet compartment, bathroom and closet shall have a ceiling height of not less than seven feet.

EXCEPTION: A ceiling height of six feet, six inches is permitted over bathtubs and in shower compartments measured from the finished floor of the tub or receptor to the finished ceiling.

(c) **Hallways.** Every hallway in a dwelling, apartment house or hotel shall have a clear ceiling height of not less than seven feet measured from the finished floor to the finished ceiling.

(d) **Sloping or Furred Ceilings.** If any room in any building has a sloping ceiling, the prescribed ceiling height for the room is required in only $\frac{1}{2}$ the area thereof. No portion of the room measuring less than five feet from the finished floor to the finished ceiling shall be included in any computation of the minimum area thereof, nor shall any portion of the room enclosure have a clear height of less than three feet.

If any room in any building has a furred ceiling, the prescribed ceiling height for the room is required in only $\frac{1}{2}$ the area thereof, but in no case shall the height of the furred ceiling be less than seven feet.

SEC. 91.4908 — SANITATION REQUIRED — WATER CLOSETS AND LAVATORIES

(a) **Water Closet—Dwelling Units.** Every dwelling unit shall be provided with a water closet and lavatory with hot and cold running water for the exclusive use of the occupants thereof. The water closet and lavatory shall be installed in a separate compartment, or in a compartment with a bathtub or shower.

(b) **Water Closet — Guest Rooms — Number and Accessibility.** In every residential building having one or more guest rooms not provided with a private water closet and lavatory, there shall be provided on each floor for each sex inhabiting said guest rooms at least one water closet and one lavatory with hot and cold running water installed in a separate compartment accessible from a public hallway and located not more than 100 feet distance from the entrance door of each room it serves. Additional water closets and lavatories shall be provided on each floor for each sex at the rate of one for each additional ten guests or fractional number thereof in excess of ten. Such facilities shall be distinctly marked for "Men" or "Women."

(c) **Water Closet — Guest Rooms Served by Community Kitchen.** Any guest room served by a community kitchen shall be provided with one water closet and one lavatory with hot and cold running water with a separate compartment or combined with a bath or shower compartment accessible directly from the guest room for the exclusive use of the occupants thereof.

(d) **Separation.** Every water closet compartment shall be equipped with a full door, properly hung and provided with a lock or locking bolt. No room housing a water closet shall open directly into any kitchen area.

(e) **Water Closet Materials.** The walls enclosing a water closet compartment in an apartment house or hotel shall be painted plaster or constructed of nonabsorbent material.

The floor of every water closet compartment in an apartment house or hotel shall be made waterproof with an approved, nonabsorbent material. Every water closet shall be an earthenware bowl. It shall also have an earthenware seat integrated with the bowl; or may have attached directly to the bowl a wood seat made nonabsorbent with varnish or enamel; or a seat made of some nonabsorbent material.

SEE RULE OF GENERAL APPLICATION #22-69 IN APPENDIX SECTION

SEC. 91.4909 — SANITATION REQUIRED — BATHS

(a) **Bath — Dwelling Unit.** Every dwelling unit shall be provided with a bathtub or shower with hot and cold running water for the exclusive use of the occupants thereof. Said bathtub or shower shall be installed in a separate compartment or combined with water closet compartment.

(b) **Bath — Guest Rooms.** In every residential building having one or more guest rooms not provided with a private bathtub or shower, there shall be provided on each floor for each sex inhabiting said guest rooms at least one bathtub or shower with hot and cold running water installed in a separate compartment accessible from a public hallway. Additional bathtubs or showers shall be provided on each floor for each sex at the rate of one for each additional ten guests or fractional number thereof in excess of ten. Such facilities shall be distinctly marked for "Men" or "Women."

(c) **Bath — Doors and Construction.** The doors, walls and floor of every bathroom or shower room in an apartment house or hotel shall meet the requirements of Subsections 91.4908(d) and (e) pertaining to doors, walls and floors of a water closet compartment in the building.

Shower walls, including showers over bathtubs, shall be constructed of dense non-absorbent waterproof materials to a height of not less than six feet above the floor.

(d) **Shower and Shower-Bath Enclosures.** All wall panels and doors enclosing showers or shower-baths and all glazed open-

ings within 30 inches shall be constructed of impact resistant materials. All hinged shower doors and shower-bath doors shall open outward. A single shower-bath one piece unit comprised of bathtub and enclosure for a shower is a plumbing fixture and shall comply with the provisions of the Plumbing Code.

EXCEPTION: Windows located in shower compartments or tub walls need not comply with this Subsection, provided the sill of the window is not less than five feet above the tub or shower floor.

Glass used in the fabrication of shower and shower-bath wall panels and doors and glazed openings within 30 inches shall be of the following types and minimum thicknesses only:

1. Wire reinforced glass, 7/32-inch thick, in which the diameter of the wire used therein shall not be less than 0.02 inch, and the area of glass enclosed by the wire strands shall not exceed 1½ square inches.

2. Tempered glass, 3/16-inch thick.

3. Laminated safety glass, 7/32-inch thick.

4. Glass with other thickness if identified by a permanent label as having met the performance requirements of ANSI Z97.1 Standard.

Plastics used in the fabrication of shower and shower-bath wall panels and doors shall be of the following types and minimum thicknesses:

1. Fiberglass reinforced panels having a weight of not less than eight ounces per square foot.

2. Acrylic resin thermoplastic, ½-inch thick.

3. High-impact styrene, ½-inch thick.

4. Other plastic materials which furnish equal protection, when approved by the Department.

SEC. 91.4910 — SANITATION REQUIRED — SINKS AND FAUCETS

(a) **Kitchen Sink.** At least one kitchen sink provided with hot and cold running water shall be installed in the kitchen within every dwelling unit and within every community kitchen.

(b) **Repealed.**

(c) **Undersink Space.** The space underneath any sink or wash tray in any building shall not be so enclosed as to prevent its ventilation or inspection. A door, panel, or other closure may be provided in the front or around any side of the space underneath the sink or wash tray, but no front closure shall be nailed or otherwise permanently fixed in position.

(d) **Faucets.** Faucets with running water sufficient in number to wash all yards, courts and passageways shall be installed in every dwelling, apartment house or hotel.

SEC. 91.4911 — WINDOWS AND VENTILATION — ROOMS

(a) **Rooms.** In every residential building, every habitable room, water closet, bath, toilet, slop sink, general utility room or service porch shall have one or more windows unless permitted to be ventilated by a fan exhaust system of ventilation pursuant to the provisions of this Section.

(b) **Window Exposure.** Each window shall open directly into a street or public alley, or a yard or court, meeting requirements of this Division, and located on the same lot as the building.

Vent shafts shall be used only for light and ventilation of other than habitable rooms.

A window required for a room in a dwelling, apartment house, or hotel shall not open through a roofed porch or patio cover unless the porch or patio cover:

1. Abuts a street, yard, or court; and
2. Has a ceiling height not less than seven feet; and
3. Has a longer side at least 65% open and unobstructed.

(c) **Window Area-Habitable Rooms.** The total window area for any habitable room shall be not less than ten square feet or one-tenth of the superficial floor area of the room, whichever is greater.

Each required window shall be so located as to light properly all portions of the room it serves. Vented portions of windows or louvers shall be equal to at least one-half of the aggregate window area required in the room.

(d) **Window Areas — Water Closet Compartments, Service Porches, etc.** The total window area in any water closet, bath, toilet, slop sink, or general utility room or service porch shall be:

1. In a dwelling, not less than three square feet;
2. In an apartment house or hotel, not less than three square feet in water closet, bath, toilet rooms and not less than six square feet in slop sink, utility rooms or service porches;
3. In any compartment containing more than one water closet, bath, or urinal, the total window area shall be equal to three square feet for each water closet, bath, or urinal, but need not exceed $\frac{1}{4}$ of the superficial floor area of the room.

(e) **Measurement.** All measurements for window area shall be taken to the outside of the window sash.

(f) **Fan Exhaust System.** In lieu of any window required by this Section, the following rooms in dwellings, apartment houses and hotels may be provided with an approved fan exhaust system of ventilation connected directly to the outside.

1. In hotels.
 - (i) Kitchen, scullery, pantry, but not including a community kitchen.
 - (ii) Laundry room or slop sink room.
2. In apartment houses or hotels.
 - (i) Public dining, general amusement, entertainment, reception, general utility room, or service porch.
 - (ii) Water closet or shower compartment, bath or toilet room.
3. In a dwelling, a water closet, bath, toilet, slop sink, general utility room or service porch.

The fan exhaust system of ventilation shall be made operable from the light switch in the room and shall be designed and operated so as to produce a complete change of air in not more than:

1. Five minutes in a scullery in a hotel, and in a water closet, shower, bath, toilet or slop sink compartment in a dwelling, apartment house or hotel;
2. Fifteen minutes in every other allowed location in an apartment house or hotel.

SECS. 91.4912 thru 91.4918 — (Repealed)

SEC. 91.4919 — PLUMBING REQUIREMENTS

(a) **Fixtures.** Plumbing fixtures shall be installed in every dwelling, apartment house and hotel as required by this Division.

(b) **Access.** The water and waste connection to every bathtub shall be exposed and accessible, or shall be provided with a 12-inch by 12-inch minimum access door.

An 18-inch by 24-inch access passageway shall be provided to every plumbing cleanout. Such passageway shall not be more than 20 feet in length from an opening in the exterior wall of the building or from a trap door within the building.

EXCEPTION: In the event there are 30 inches of clearance from the ground to the underside of the floor joists, the above-mentioned 20 foot limitation shall not apply.

(c) **Plumbing.** All plumbing shall comply with the requirements of Article 4, Chapter 9 of the Los Angeles Municipal Code.

RULE OF GENERAL APPLICATION #22-68 APPLIES. SEE APPENDIX LISTING.

(d) **Anchorage of Water Heaters.** Water heaters having non-rigid water connections and over four feet in height from the base to the top of the tank case shall be anchored or strapped to prevent horizontal and vertical displacement due to earthquake.

SEC. 91.4920 — ELECTRICAL REQUIREMENTS

(a) **Service.** Every residential building shall be provided with electrical service as required by Article 3, Chapter 9 (Electrical Code) of the Los Angeles Municipal Code.

(b) **Fixtures and Wiring.** All electrical fixtures and wiring shall be installed as required by Article 3, Chapter 9 of the Los Angeles Municipal Code.

(c) **Electric Meter Location.** Electric meters shall be in a weatherproof housing unless of an approved weatherproof type. Such housing shall have a full opening door on corrosion-resistive hinges, and shall be provided with a positive catch to fasten the door in a closed position. The housing shall be deep enough to permit the closing of the door when the meter is in place.

SEC. 91.4921 — HEATING AND VENTILATING REQUIREMENTS

(a) **Heating.** Every dwelling unit and guest room shall be provided with heating facilities capable of maintaining a room temperature of 70° F at a point three feet above the floor in all habitable rooms. No unvented or open flame gas heater shall be permitted.

(b) **Equipment.** All gas-burning heat appliances and equipment shall conform to the provisions of Article 5, Chapter 9 of the Los Angeles Municipal Code. All electrical heating appliances and equipment shall conform to the provisions of Article 3, Chapter 9 of the Los Angeles Municipal Code.

(c) **Water Heater and Warm Air Furnace Locations.*** Gas-burning water heaters shall be located as required by Article 4, Chapter 9 of the Los Angeles Municipal Code and shall not be

[*See excerpts from L. A. Plumbing (Sec. 94.21309) and Heating Codes (Sec. 95.3330) in APPENDIX section immediately following this code.]

located under any stairway except as provided in Section 3308(f) of this Article.

Gas-burning warm air furnaces shall be located as required by Article 5, Chapter 9 of the Los Angeles Municipal Code.

(d) Floor Furnaces and Wall Heaters. Floor furnaces and wall heaters shall comply with the following requirements:

1. **Location.** No wood door may swing nearer than 12 inches to any unprotected portion of the combustion chamber of the heater, nor may any combustion heater be installed less than 18 inches below any wood door, shelf, cupboard, or other combustible portion of the building;

2. **Access.** An 18-inch by 24-inch access passageway shall be provided to every floor furnace. Such access shall be not more than 20 feet in length from an opening in the exterior wall of the building or from a trap door within the building.

***EXCEPTION:** In the event the passageway has 30 inches of clearance from the ground to the underside of the floor joists, the above-mentioned 20-foot limitation shall not apply.*

3. **Clearance.** The lowest portion of the floor furnace shall have at least a six-inch clearance from the ground, except that where the lower six-inch portion of the floor furnace is sealed by the manufacturer to prevent entrance of water, the clearance may be reduced to not less than two inches. When that clearance is not present, the ground below and to the sides shall be excavated to form a "basin-like" pit under the furnace so that there is a six-inch clearance beneath the lowest portion of the furnace and a 12-inch clearance on all sides, except the control side which shall have an 18-inch clearance. Whenever the excavation exceeds 12 inches in depth, or water seepage is likely, a watertight copper pan, concrete pit, or other suitable material shall be used. A copper pan shall be made of not less than 16-ounce-per-square-foot sheet copper. The pan shall be anchored in place, so as to prevent floating and the walls shall extend at least four inches above the adjacent ground level, with 12-inch clearance on all sides except the control side, which shall have 18-inch clearance. When the equipment is sealed by the manufacturer to meet this condition, the pan or pit may be omitted if not required for maintaining a dry condition for service access.

(f) Venting of Gas Heating Appliances. Every gas-burning appliance, except ranges, hot plates and refrigerators, approved by a nationally recognized testing agency for unvented use, shall be connected to an effective flue or vent leading to the outside air. Such flue or vent shall be not less in size than the vent collar on the appliance.

SEC. 91.4922 — FIRE PROTECTION — ALARMS

(a) Required. Every apartment house three stories or more in height > or containing more than 15 apartments and every hotel three stories or more in height or < containing 20 or more guest rooms, shall have installed therein an approved automatic or manually operated fire alarm system designed to warn the occupants of the building in the event of fire. Such fire alarm system shall be so designed that all occupants of the building may be warned simultaneously. No signal or intercommunicating system used for any purpose other than fire warning shall be used to meet the requirements of this section.

***EXCEPTION:** Fire protection alarms, if nonexistent, shall not be required in an apartment house or hotel erected for*

such use prior to September 19, 1947, unless required to comply with the provisions of Section 91.1302 of this Code.

(b) **Installation Standards.** Installation, inspection, and maintenance of the fire alarm system shall be in accordance with the requirements of the Los Angeles Fire Department.

(c) **Locations.** Stations for operating any manually operated fire alarm system shall be placed immediately adjacent to the telephone switchboard in the building, if there is a switchboard, and at such other locations as may be required by the Fire Department.

SEC. 91.4923 — FIRE PROTECTION — AUTOMATIC SPRINKLER SYSTEMS

Every story in an apartment house or hotel having a floor surface elevation more than four feet lower than the highest elevation of the floor, landing, or tread of any required exit from that story shall be equipped with an automatic sprinkler system complying with the requirements of Article 4, Chapter IX, of the Los Angeles Municipal Code.

EXCEPTIONS: 1. *An automatic sprinkler system, if non-existent, shall not be required in an apartment house or hotel erected for such use prior to September 19, 1947, unless such system is required by Section 91.1603(g) of this Code or unless required to comply with the provisions of Section 91.1302 of this Code.*

2. *Any compartment or room having a floor area not exceeding 1500 square feet and not used for storing combustible materials need not be sprinklered. For the purpose of this exception, a Group J-1 Occupancy shall not be considered a compartment or room for the storing of combustible materials.*

3. *Sprinklers need not be installed in locations expressly excepted in the Los Angeles Plumbing Code, provided other approved fire protection equipment is installed.*

SEC. 91.4924 — (Repealed)

SEC. 91.4925 — FIRE PROTECTION — DRY STANDPIPES

(a) **General.** Every apartment house or hotel, four or more stories in height, shall have one or more dry metallic standpipes.

EXCEPTION: *Dry standpipes, if nonexistent, shall not be required in an apartment house or hotel erected for such use prior to January 1, 1943.*

(b) **Installation.** The installation, accessibility and size of dry standpipes shall be as required by Article 4 of Chapter IX of the Los Angeles Municipal Code.

SEC. 91.4926 — FIRE PROTECTION — WET STANDPIPES

(a) **General.** Every apartment house or hotel three or more stories in height shall be equipped with one or more wet standpipes as required by Section 91.0511.

EXCEPTIONS: 1. *Wet standpipes, if nonexistent, shall not be required in an apartment house or hotel erected for such use prior to January 1, 1943.*

2. *The requirements of this Subsection shall not apply to completely sprinklered buildings or buildings not exceeding*

three stories in height where the first story is unused under-floor space or a J-1 Occupancy.

(b) **Installation.** The installation of wet standpipes shall be as required by Article 4 of Chapter IX of the Los Angeles Municipal Code (Plumbing Code).

(c) **Hallways.** Standpipes, hose, and their supports shall be installed so as not to obstruct any public hallway, stairway or any exit.

(d) Repealed.

SEC. 91.4927 — BASEMENTS AND CELLARS

(a) **Walls and Floor.** The walls and floor of every basement or cellar used for living purposes and which are below the ground level shall be waterproofed and damp-proofed by an approved method. When required by Section 91.4903 (f) of this Division, the walls and ceilings shall be plastered.

(b) Repealed.

(c) **Sprinklers.** Basements and cellars in apartment houses and hotels shall be sprinklered as required in Subsection 91.4923 (a) of this Division.

(d) **Ventilation.** Every basement and cellar shall be ventilated as required for underfloor space, or shall have openable window area equal to the required area for ventilation openings.

SEC. 91.4928 — UNDERFLOOR AREA

(a) **Closure.** The air space below any residential building must be completely enclosed by the exterior walls.

***EXCEPTION:** Areas having a clear height of six feet, six inches or more below the floor joists need not be enclosed.*

(b) **Ventilation.** Openings for ventilating the under floor space shall be provided on at least three sides of all residential buildings and in all interior footing walls. The net ventilating area of the openings shall be proportioned on the basis of 2 square feet for each 25 lineal feet of wall. One opening shall be located within three feet of each end of the wall. Openings in exterior walls shall be screened with corrosion resistant mesh having not greater than ¼ inch openings.

(c) **Ground Surface Plane.** The ground surface plane under the floor shall be at least:

1. 12 inches below girders supporting floor joists;
2. 18 inches below floor joist or subfloor of plank-type floor construction.

No wood shall be nearer than six inches to any earth unless separated by concrete at least three inches in thickness.

(d) **Sanitation.** The air space below the floor joist shall be kept clean and free from any accumulation of rubbish, debris or filth.

(e) **Separation From Underfloor Space.** Underfloor space used for any purpose other than the servicing of utilities shall be considered and treated as a cellar or basement and shall meet all the requirements applicable thereto.

SEC. 91.4929 — BOILER ROOMS

Boiler rooms in residential buildings shall be constructed as required by Section 91.4209 of this Code.

SEC. 91.4930 — PROHIBITED USES

(a) **Cooking.** It shall be unlawful for any person to cook or prepare food, or to permit another person to cook or prepare food, in any building except in a kitchen, or light housekeeping room, as provided for by this Division.

(b) **Sleeping.** It shall be unlawful for any person to use or to permit another person to use any of the following portions of a building for sleeping purposes:

1. A kitchen, hallway, water closet, bath, cellar, shower compartment, or slop sink room;

2. Any other room or place which does not comply with the provisions of this Division as a sleeping room or in which sleeping is dangerous, or prejudicial to life or health by reason of an overcrowded condition, a want of light, windows, ventilation, or drainage; dampness or offensive, obnoxious or poisonous odors in the room or place.

(c) **Amusement Rooms.** No amusement, entertainment, reception, public dining or similar room in any building shall be used for sleeping unless it meets all the requirements for sleeping rooms.

(d) **Hazardous Materials.** The storage, processing or use of hazardous materials shall comply with all the applicable sections of the Los Angeles Municipal Code.

**SEC. 91.4930.1 — EXCEPTION TO PROHIBITED USES —
LIGHT HOUSEKEEPING ROOMS**

(a) This Division does not prevent the use of a room as a light housekeeping room in any building which was erected prior to September 20, 1963, provided that such room fully complies with the provisions of Subsection (b) of this Section; except that the provisions of Sections 91.4906(c) and 91.4908(d) of this Division shall not apply to such a room.

(b) Special Provisions for Light Housekeeping Rooms.

1. Light housekeeping rooms shall contain not less than 150 square feet in area and shall be occupied by not more than two people. The cooking appliance therein, if any, shall be used solely for the cooking or preparation of meals for consumption by the occupants of the room.

EXCEPTION: A room having a superficial floor area of not less than 120 square feet may be used for light housekeeping if it is occupied by only one person.

2. The cooking appliances used therein, if any, shall have no more than two burners. If electric appliances are used, they shall have been tested and approved by the Underwriters Laboratories. If gas appliances are used, they shall have been tested and approved by the American Gas Association.

3. The installation, maintenance or use of said cooking appliance shall not be hazardous to life, health or property.

4. (i) Said cooking appliance shall rest upon its own legs, or shall be an approved, built-in unit of fixed installation. Said appliance shall be set not closer than six inches from any wall or projection thereof, and shall rest upon an impervious surface.

(ii) The walls behind and adjacent to said cooking appliance shall be lined or back-flashed with incombustible material equivalent to ¾-inch asbestos mill board. The back-flashing shall extend from 12 inches below to 24 inches above the base of the appliance. There shall be a clear and unobstructed space of 36 inches above the surface of the cooking appliance.

EXCEPTION: *The provisions of (4) shall not apply to approved prefabricated kitchen units.*

5. Gas-burning appliances shall be connected to the gas supply piping by approved metal piping with an approved gas shut-off valve readily accessible within the room, and maintained in accordance with the provisions of Article 4 of this Chapter.

Electrical appliances and serving circuits shall be installed and maintained in accordance with the provisions of Article 3 of this Chapter.

6. The room shall contain an approved sink with hot and cold running water.

7. An approved storage cabinet shall be installed in the room. All food, dishes, and cooking and eating utensils shall be stored therein when not in use.

8. The bed in such a room, or any drapes, curtains or other readily combustible material shall be so located that they do not come in contact with the cooking appliances, if any.

9. Any toilet room opening directly into such a room shall have a tight-fitting door.

10. An approved method of heating shall be installed in each such room. Cooking appliances shall not be used for the purpose of heating such rooms. No cooking appliance shall be installed within a closet in such a room.

(c) In any building containing six or more light housekeeping rooms, there shall be one water closet and one bath facility for each five units or fraction thereof. In any building containing five or less light housekeeping rooms, there shall be one water closet and one bath facility which may be in the same room for each three light housekeeping units in the building. Such toilet and bath facilities shall be accessible to and from a public hallway.

RULES OF GENERAL APPLICATION #24-69 AND #28-69 APPLY.

SEE APPENDIX LISTING.

SEC. 91.4930.2 — EXCEPTIONS TO PROHIBITED USES — EFFICIENCY DWELLING UNIT

(a) **General.** Efficiency dwelling units will be permitted which comply with all of the requirements of this section.

(b) **Area.** The room shall have a minimum of 220 square feet of superficial floor area exclusive of bath, closet and water closet areas. An additional 100 square feet of superficial floor area shall be provided for each occupant thereof in excess of two.

(c) **Requirements.** Each efficiency dwelling unit shall comply with the requirements of Division 49 of this Code applicable to dwelling units except that the kitchen need not be located in a room separate from the sleeping quarters.

(d) **Zoning.** Each efficiency dwelling unit shall comply with applicable provisions of Article 2, Chapter 1 (Comprehensive Zoning Plan) of the Los Angeles Municipal Code.

(e) **Toilet Facilities.** One water closet, lavatory with hot and cold running water and bathtub or shower shall be provided for each unit.

(f) **Range Vent.** Cooking facilities shall be vented directly to the outside air by means of a mechanical exhaust system having a capacity of at least 150 cubic feet per minute.

(g) **Heating.** An approved method of heating shall be installed

in each unit. Cooking facilities shall not be used for the purpose of heating such units.

SEC. 91.4931 — MAINTENANCE AND REPAIR

(a) **Maintenance.** Every building shall be maintained in good repair and all exterior surfaces shall be reasonably protected from the elements and against decay by paint or other approved protective coating.

(b) **Roof.** The roof of every building shall be kept waterproof, and all storm or casual water shall be properly drained and conveyed from the roof to a storm drain, or street gutter as required by Division 30 of this Code.

(c) **Drainage.** All portions of a lot about a building, including the yards, areaways, vent shafts, courts, and passageways, shall be properly graded and drained to carry the water away from the building.

(d) **Surfacing, etc.** If the Department finds it necessary for the protection of the health and safety of the occupants, or for the proper sanitation of a dwelling, apartment house or hotel, it may require that the yards, areaways, vent shafts, courts, passageways, or other parts of the lot surrounding the building be graveled, or properly paved and surfaced with concrete, asphalt, or similar material.

(e) **Painting of Room Walls and Ceilings.** The walls and ceiling of every room in a dwelling, apartment house or hotel shall be finished, sealed, coated or covered in an approved manner. Approved material shall be applied as often as may be necessary to maintain the walls and ceiling in a clean and sanitary condition.

(f) **Painting of Court and Shaft Walls.** Unless built of light-colored materials, the walls of courts and shafts shall be painted be finished, sealed, coated or covered in an approved manner. Approved material shall be applied as often as may be necessary to maintain the walls and ceiling in a clean and sanitary condition.

(g) **Repealed.**

(h) **Painting of Wallpaper.** Painting or calcimining over wallpaper is permissible.

(i) **Screening.** Whenever necessary for the health of the occupants, or for the proper sanitation or cleanliness of any building, acceptable mosquito screening shall be provided for each exterior door, window, or other opening in the exterior walls of the building.

(j) **Garbage Receptacle Compartment.** Every closet or compartment in a building used for storing a garbage receptacle shall be lined on all its interior walls and on the inside of all its doors with a nonabsorbent, washable material, with all joints made tight.

(k) **Fences.** All fences shall be maintained in good repair and shall be kept straight, uniform and structurally sound. Wooden fences shall be either painted or stained or otherwise treated or sealed in an approved manner to prevent their becoming a nuisance from weathering or deterioration.

(l) **Sanitation.** Each room, hallway, passageway, stairway, wall, partition, ceiling, floor, skylight, glass window, door, carpet, rug, matting, window curtain, water closet compartment or room, toilet room, bathroom, slop-sink room, wash room, plumbing fixture, drain, roof, closet, cellar, basement, yard, court, lot, and the premises of every building shall be kept in every part clean, sanitary and free from all accumulation of debris, filth, rubbish, garbage, vermin, and other offensive matter.

(m) **Dangerous Articles.** No article that is dangerous or de-

trimental to life or to the health of the occupants, including any feed, hay, straw, excelsior, cotton, paper stock, rags, junk, or any other material that may create a fire hazard shall be kept, stored, or handled in any part of a dwelling, apartment house or hotel, or on the lot on which such building is located.

SEC. 91.4932 — VEHICLE PARKING

(a) **General.** Any portion of a residential building used for the parking, storing, repairing or servicing of any automobile or other motor vehicle shall comply with all applicable requirements of this Code for the occupancy classification into which such portion falls.

(b) **Ceiling Height.** Any portion of a residential building used for the parking, storing, repairing, or servicing of any automobile or other motor vehicle shall have a clear and unobstructed ceiling height of not less than six feet, six inches measured from finished floor to the finished ceiling.

EXCEPTION: Storage compartments or other construction and equipment may extend down to a point four feet, six inches above the finished floor of the garage for a maximum horizontal distance of four feet over the portion of any required parking space occupied by the hood of an automobile. Such reduced height shall not be allowed in areas subjected to pedestrian travel.

SEC. 91.4933 — PERMITS AND OCCUPANCY

(a) **Repair and Alteration.** A permit shall be obtained as required in Section 91.0201 of this Code for all construction, alteration, and repair required to rehabilitate a substandard residential building or residential buildings subject to repair.

(b) **Demolition.** A permit shall be obtained as required by Section 91.0201 of this Code for all demolition of a substandard residential building or residential buildings subject to repair.

(c) **Revocation of Certificate of Occupancy.** When compliance has not been secured within the time limit stated on the Notice issued to the owner notifying him that a building has been determined to be a substandard residential building or a residential building subject to repair, the Department may revoke the Certificate of Occupancy for the residential portions of the building.

In this event, a new Certificate of Occupancy shall be issued upon completion of the repairs or alterations required to rehabilitate the residential building. A Certificate of Occupancy shall not be required for a one- or two-family dwelling. Such dwellings are approved for occupancy when the General Manager files with the County Recorder a clearance form terminating the status of the building as a substandard residential building or a residential building subject to repair.

SEC. 91.4934 — ENFORCEMENT

(a) **General.** Whenever the Superintendent of Building determines by inspection that an existing residential building has become substandard or a residential building subject to repair, he shall institute proceedings to cause the repair or rehabilitation of the building, or if such repairs or rehabilitation are impracticable, then he shall order the building immediately vacated and demolished.

(b) **Notification.** The Superintendent of Building shall give a notice in writing to the owner of a substandard residential building, or a residential building subject to repair, or to any person in control of the building, specifying the inadequacies and hazards contained therein.

Within 30 days after such notice is given, the owner or his agents shall obtain the necessary permits and shall physically

commence the elimination of the specified inadequacies and hazards, or shall cause the building to be vacated.

If such notice shall not have been complied with, on or before the expiration of 45 days after notice is given, the Superintendent of Building may order the building immediately vacated and institute appropriate action or proceedings to correct or abate the conditions.

However, upon written application by an interested party, for good cause shown and where no imminent risk of life or property is present, the Department or the Board, in case an appeal is made to it (Section 98.0403), may grant a reasonable extension of time not to exceed 120 days within which the work required must be commenced. Provided, however, that any appeal to the Board for an extension of time to repair a vacant privately-owned building shall be decided by the Board no later than 30 days after the hearing thereon and may only be granted upon the condition that such repairs be completed within a maximum period of 180 days and upon the further condition that no additional time will be granted.

(c) **Manner of Giving Notice.** The notices required by Subsection (b) of this Section shall be given in the manner prescribed in Section 11.00 (1) of the Los Angeles Municipal Code.

The failure of any owner or other person to receive such notice shall not affect in any manner the validity of any proceedings taken thereunder.

At the time of giving the above-mentioned notice, the Superintendent of Building shall also file with the office of the County Recorder a certificate that the building described is either a substandard residential building or a residential building subject to repair, and that the owner thereof has been so notified.

After all required corrections to a substandard residential building or a residential building subject to repair have been made, the Superintendent of Building shall file with the office of the County Recorder a clearance form which terminates the status of the building as a substandard residential building or a residential building subject to repair.

(d) **Vacated Buildings.** Any substandard building or residential building subject to repair, ordered vacated in accordance with subsections (a) and (b) of this Section, shall not be re-occupied until the inadequacies or hazards necessitating its vacation have been eliminated and a new Certificate of Occupancy or clearance obtained as provided in Subsection 91.4933(c).

Each such vacated building shall be locked and otherwise secured against ingress and the Department shall post thereon a placard stating:

**"VACATED BUILDING
DO NOT ENTER BY ORDER OF
THE DEPARTMENT OF BUILDING AND SAFETY
CITY OF LOS ANGELES**

It is a misdemeanor to occupy this building!

It is a misdemeanor to remove this placard!

Sec. 91.4934(d) Los Angeles Municipal Code"

The "vacated building" placard shall not be removed from the building by other than a representative of the Department.

Each such vacated building shall be rehabilitated within three months after the date of vacation, or it shall be removed or demolished. If this rehabilitation, removal, or demolition has not been accomplished within the above-mentioned three months' period, then the Superintendent of Building shall have the power, in addition to any other remedy provided in the law, to cause the correction, removal or demolition of each such vacated

building or structure by such means as he shall determine are appropriate.

Whenever the Superintendent of Building determines to cause the repair or removal of the building he shall notify the owner or other persons in charge or control thereof of the intention to do so and shall specify a date certain upon which bids shall be solicited ➤ or a demolition work order executed ◀ to accomplish the necessary work. This date shall be not sooner than ten days from the date such notice is given. Within ten days from the service of the notice, the owner or other person having charge and control over the building may appeal to the Board of Building and Safety Commissioners in accordance with such procedure as may be established by the Board. ➤ One or more annual unit-price demolition contracts may be awarded for the demolition of privately-owned readily accessible one and two-story wood frame structures located on level lots. For the purposes of this section, an annual unit-price demolition contract shall mean a 12-month contract awarded by the Superintendent of Building after competitive bidding based upon both stipulated prices and price per square foot of building area for the demolition and removal of buildings, structures and accompanying items on certain properties when and as directed by the Superintendent of Building by means of a work order. No demolition work order shall be executed except in conjunction with the necessary contract or contracts. ◀

The cost of correction, removal or demolition may be paid from the "Repair and Demolition Fund" as established in Section 96.120 of the Municipal Code, and such costs shall be assessed against the property upon which such conditions exist in accordance with the provisions of Sections 96.120.1 and 96.121 of the Municipal Code. The procedures to be followed for the assessment of such cost shall be in accordance with Sections 96.119, 96.119.1, 96.120.1, and 96.121 of the Municipal Code

SEC. 91.4934.1 — APPEAL FROM ORDER

Within thirty (30) days from the service of the order as provided in Section 91.4934, the owner or other person having charge and control over any building or structure affected by such order may appeal to the Board of Building and Safety Commissioners in accordance with such procedure as may be established by such Board.

Upon such appeal the Board may affirm, modify or annul the order appealed from, including any of the terms or conditions thereof.

No order to repair, vacate and repair, or demolish any structure shall be enforced if annulled by the Board on appeal or enforced contrary to any modification of such order made by the Board on appeal.

SEC. 91.4935 — VIOLATIONS

(a) General. Any person who violates or causes or permits another person to violate any provision or requirement of this Division is guilty of a misdemeanor.

(b) Penalties. Any person convicted of a misdemeanor due to violation of any provision or requirement of this Division is subject to penalties as prescribed by Section 11.00 (m) of the Los Angeles Municipal Code which is quoted in part as follows:

"A person convicted of a misdemeanor under the provisions of this Code, unless provision is otherwise herein made, shall be punishable by a fine of not more than \$500.00 or by imprisonment in the City Jail for a period of not more than six months, or by both such fine and imprisonment. Each such person shall be guilty of a separate offense for each and every day during any portion of which any violation of any provision of this Code is committed, continued or permitted by such person and shall be punishable accordingly."

DIVISION 52 — SIGNS

SEC. 91.5201 — DEFINITIONS.

For the purpose of this Division, certain terms are defined as follows:

Advertising Statuary. An imitation, representation or similitude of a person or thing which is sculptured, moulded, modeled or cast in any solid or plastic substance, material or fabric which for advertising purposes is erected or attached to the surface of the ground.

Face of Building. The general outer surface, not including cornices, bay windows, or architectural projections of any main exterior wall of a building.

Freeway. A highway in respect to which the owners of abutting lands have no right or easement of access to or from their abutting lands or in respect to which such owners have only limited or restricted right or easement of access, and which is declared to be such in compliance with the Streets and Highways Code of the State of California.

Front Exterior Wall. The main exterior wall of the building which faces and is nearest to the street. Where more than one building is located on a lot, the building nearest the street shall be used in determining the front exterior wall.

Ground Level. The highest elevation of the existing ground surface directly under a sign.

Main Traveled Roadway of a Freeway. That portion of a freeway, including interchange roadways connecting one freeway with another, which is designed for the movement of large volumes of vehicular traffic, efficiently and safely at high speed, but not including service roadways, landscaped areas, or ingress or egress ramps connecting the freeway with other streets.

Outdoor Advertising Structure. A structure or device erected upon the surface of the ground for outdoor advertising purposes or to attract the attention of the public, but not including a post sign.

Post Sign. A structure or device erected or affixed to poles or posts for outdoor advertising purposes or to attract the attention of the public, and constructed in accordance with the provisions of Section 91.5211.

Projecting Sign. A sign other than a wall sign suspended from or suspended by a building or structure and projecting out therefrom.

Projection. The distance by which a sign extends beyond the building line.

Roof Sign. A sign erected upon or above a roof or parapet of a building or structure.

Sign. Any display board, screen, object or part thereof used to announce, declare, demonstrate, display, or otherwise advertise and attract the attention of the public.

Sign Area. The total area of the copy. In the case of a sign consisting of cutout letters or displays, the area measured within the periphery of the cutout letters or displays shall be included.

Subdivision Advertising Structure. An outdoor advertising structure used exclusively for the purpose of advertising the subdivision upon which it is erected.

Surface Sign Space. The solid flat surface of any one side of an outdoor advertising structure used for advertising purposes, exclusive of letters, figures, characters or representation in cut-out or irregular form, maintained in conjunction with, attached to, or superimposed upon the outdoor advertising structure.

Wall Sign. Any sign attached to, or erected against the wall of a building or structure with the exposed face of the sign in a plane approximately parallel to the plane of said wall.

SEC. 91.5202 — CONSTRUCTION, ALTERATION, REPAIR OF SIGNS

(a) **Scope.** This Division is intended to regulate the construction, erection, alteration, repair and maintenance of all signs and their supports.

(b) **Permits — Procedure for Permits Adjacent to Freeways.**

1. A building permit as specified in Division 2 shall be required for every sign and sign structure regulated by this Division. Where signs are illuminated by electric lighting, a separate electrical permit shall be obtained as required by Article 3, Chapter 9 of the Municipal Code.

2. No building or electrical permit shall be issued for any sign or sign structure, regardless of location, unless the Department of Building and Safety or the Board, in case an appeal is made to it under Section 98.0403 shall have first determined that the sign or sign structure is not designed to have the advertising thereon maintained primarily to be viewed from a main traveled roadway of a freeway.

3. Every application for a building or electrical permit for a sign or sign structure on a building (excluding those listed in Section 91.5202(g) as "Exceptions"), which sign or sign structure is to be within 500 feet of a main traveled roadway of a freeway, shall be considered by the Department of Building and Safety or the Board, in case an appeal is made to it under Section 98.0403, to determine whether the proposed sign or sign structure is designed to have the advertising thereon maintained primarily to be viewed from a main traveled roadway of a freeway. If it is determined that the proposed sign or sign structure is designed to have the advertising thereon so maintained, the application for a permit shall be denied. If it is determined that the proposed sign or sign structure is not designed to have the advertising thereon so maintained, such application shall be referred to the Department of Traffic. The Department of Traffic shall consider all applications referred to it, for the purpose of determining whether or not the proposed sign or sign structure, because of its location, size, nature or type, would constitute, or tend to constitute, a hazard to the safe and efficient operation of vehicles upon the freeway, or would create a condition endangering the safety of persons or property thereon. Said Department of Traffic shall return each application so referred to it, together with a statement of its determination, to the Department of Building and Safety. If the Department of Traffic has determined that the sign or sign structure, because of its location, size, nature or type, would constitute, or would tend to constitute, a hazard to the safe and efficient operation of vehicles upon the freeway, or would create a condition endangering the safety of persons or property thereon, the application for a permit shall be denied.

(c) **Plans.** Plans and specifications shall be submitted with the application for permit for each sign except cloth and banner signs. Such plans shall show complete details, method of attachment or support, location and materials to be used. Plans for support of all roof signs, and other signs subject to excessive

stress or strain shall be accompanied by structural computations.

EXCEPTION: Plans and computations will not be required for wall signs and projecting signs if less than 100 square feet in area.

Sufficient data shall be submitted to show that the supporting surface and other members of an existing building to which a sign is to be attached are in good condition, and are adequately strong to support the load.

(d) Design and Construction. Sign frames and supporting construction shall be designed and constructed in conformity with other applicable provisions of this Code, and, in addition, shall comply with the following:

1. Each portion of the structure shall be designed for the wind pressure set forth below for its height above grade:

Height Above Grade	Wind Pressure (In Pounds Per Square Foot)
Portions Less Than 60 Feet	20
Portions 60 Feet to 500 Feet	30
Portions Over 500 Feet	35

EXCEPTION: Where all portions of an outdoor advertising structure or post sign are less than 30 feet above grade, the structure may be designed for a wind pressure of 15 pounds per square foot.

2. Structural steel members shall be not less than ¼-inch thick if ungalvanized, and 3/16-inch thick if all members, including bolts and fastenings, are galvanized. Bolts and rivets used in sign structures supporting signs 100 square feet in area or more shall be not less than ½ inch in diameter. On such structures supporting signs less than 100 square feet in area, bolts and rivets shall be not less than ¾ inch in diameter.

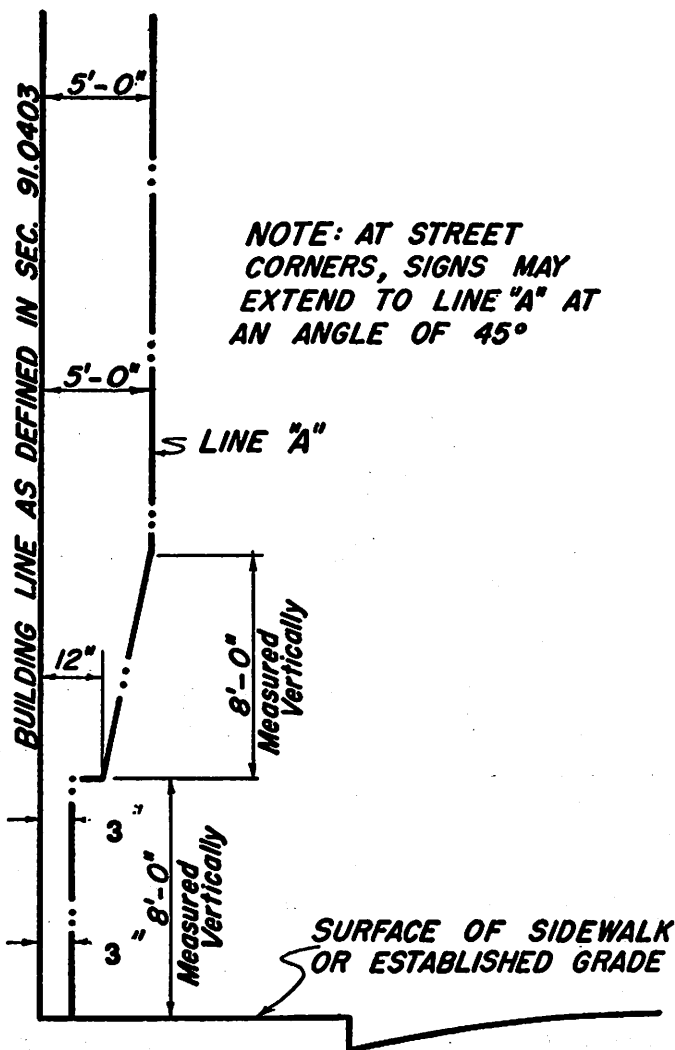
Signs erected on buildings or structures shall be securely attached by means of adequate metal brackets, expansion bolts, through bolts, or lag screws. No material, part, portion or equipment thereof or therefor shall be used which may become dangerous because of vibration, corrosion, disintegration, or for any other reason whatsoever. Wire other than stranded cable shall not be considered as adequate fastening, except for cloth and banner signs.

If supports of an existing structure are found to be inadequate, they shall be adequately strengthened before the sign is erected.

TABLE NO. 52-A — SIZE, THICKNESS AND TYPE OF GLASS PANELS IN SIGNS

MAXIMUM SIZE OF EXPOSED GLASS PANEL		MINIMUM THICKNESS OF GLASS IN INCHES	TYPE OF GLASS
ANY DIMENSION IN INCHES	AREA IN SQUARE INCHES		
30	500	1/8	Plain, Plate or Wired
45	700	3/16	Plain, Plate or Wired
144	3600	1/4	Plain, Plate or Wired
Over 144	Over 3600	1/4	Wired Glass

DIAGRAM 52-B



(e) **Projection and Clearance.** Signs may project over a public street, public sidewalk or building line as far as, but not beyond, the line marked A, as indicated in Diagram 52-B.

(f) **Materials.** Signs and their supports may be constructed of any material allowed in this Chapter for the classification and location of sign to be erected.

Glass used in signs shall be of the size, thickness and type given in Table No. 52-A.

(g) **Prohibited Locations.** 1. No sign or sign structure shall project into any public alley whatsoever below a height of 14 feet above grade or more than six inches when over 14 feet.

2. No sign or sign structure shall be erected in such a manner that any portion of its surface or supports will interfere in any way with the free use of any fire escape, exit or stand-pipe, or obstruct any required ventilator, door or stairway. No sign shall obstruct any window to such an extent that any light or ventilation is reduced to a point below that required by any law or ordinance.

3. No sign or sign structure shall be erected, the design of which has features which might cause undue distraction to pedestrians or motorists and result in the creation of a hazardous condition.

4. No sign or sign structure shall be erected, constructed, painted or maintained, regardless of the district or zone in which it is located.

(i) If such sign or sign structure, because of its location, size, nature or type, constitutes or tends to constitute a hazard to the safe and efficient operation of vehicles upon a freeway, or which creates a condition which endangers the safety of persons or property thereon; or

(ii) If such sign or sign structure is designed to have or has the advertising thereon maintained primarily to be viewed from a main traveled roadway of a freeway.

EXCEPTIONS: Paragraph (ii) of this Subdivision shall not apply to any of the following signs which are attached to or are constructed, painted, or maintained on a building and which have no mechanical or moving parts nor any arrangement of lights creating the illusion of movement:

(1) Signs identifying the building whereon such signs are located if the area of the sign (including lettering and background) is not more than 50 square feet or is not larger than 5% of the area of the side of the building which faces primarily to the freeway, whichever is greater;

(2) Signs not exceeding 50 square feet in area (including lettering and background) on which the advertising is limited to the name of any person, firm or corporation occupying the building and the type of business conducted by such person, firm or corporation, or on which the advertising is limited to the name of any product manufactured on the premises;

(3) Signs not exceeding 20 square feet in area (including lettering and background) on which the advertising thereon is limited to that which is strictly incidental and subordinate to a lawful use of the premises whereon such signs are located, including signs advertising services rendered or goods sold on the premises.

In no case shall the total area of all signs permitted under paragraphs (2) and (3) of this EXCEPTION exceed 100 square feet (including lettering and background) for each person, firm or corporation occupying the building.

This EXCEPTION shall not be construed to permit signs indicating the trade name, merchandise or services of any person or corporation who pays a consideration for the privilege of placing, maintaining or using any portion of such sign or painted advertising to the owner or occupant of the premises on which it is located.

(iii) The Department may revoke any sign permit which was secured in bad faith, through subterfuge or not in full compliance with the spirit and intent of this Division. A permit may be refused for the same reasons.

(h) **Combination Signs.** Each portion of a sign which is subject to more than one classification, shall meet the requirements for the classification to which such portion is subject.

(i) **Identification.** Every electric sign shall have an identifying number and, except for ground signs, the weight of the sign, plainly placed on the exterior surface of the sign body in a location where such information will be readily visible after installation and erection.

(j) **Maintenance.** 1. Signs and sign structures shall be maintained at all times in a state of good repair, with all braces, bolts, clips, supporting frame and fastenings free from deterioration, termite infestation, rot, rust or loosening. They shall be able to safely withstand at all times the wind pressure for which they were originally designed, and in no case less than 15 pounds per square foot.

2. Within three years from the date a freeway, or portion thereof, is open to public travel, all signs and sign structures which are maintained on a building and which are in conflict with the provision of this Section shall be removed, or shall be rearranged or relocated so as to eliminate any conflict with this Section. The Department of Building and Safety and the Department of Traffic shall determine whether or not the sign or sign structure is in conflict with the provisions of this Section. The Department or the Board of Building and Safety Commissioners, in case an appeal is made to it under Section 98.0403, shall have the same powers and duties for this purpose as those provided for in Section 91.5202(b) in connection with the application for new permits. If it is determined that any such sign or sign structure is in conflict with any of the provisions of this Section, the permittee shall be advised and permittee shall remove, rearrange or relocate such sign or sign structure within said three-year period.

3. Within one year from the date a freeway or portion thereof is opened to public travel, all signs and sign structures which are in conflict with Paragraph (ii) of Subdivision 4 of Subsection (g) of this Section shall be removed or shall be rearranged or relocated so as to eliminate any conflict with said provision.

(k) **Sound Devices.** The use of human beings or live animals, sound devices, and motion pictures or slide projectors in conjunction with any sign is prohibited.

(l) **Removal of Debris.** The base of any sign erected on the ground shall be kept clear of weeds, rubbish or other combustible material at all times.

SEC. 91.5204 — PROJECTING SIGNS

Projecting signs attached to a building shall be of incombustible materials, approved plastics or of not less than one-hour fire-resistive construction.

The thickness of any sign shall not exceed the following:

1. For a maximum projection of five feet a thickness of two feet;
2. For maximum projection of four feet a thickness of two feet, six inches;
3. For maximum projection of three feet a thickness of three feet.

SEC. 91.5205 — WALL SIGNS.

(a) **Projections.** No wall sign shall have a projection over any public street, other public property or building or building line as defined herein, greater than that permitted in Table 45-A for an architectural projection, and the area of such sign shall not exceed that permitted in Table 45-B for projections nor that permitted in Subsection (d) of this Section.

(b) **Access Clearances.** Wall signs may project not over six feet above the roof or parapet immediately adjacent thereto, provided a six foot wide, unobstructed passage to the roof is maintained at each end of the sign and at least every 50 feet in the length of the sign. When within three feet of a standpipe, fire escape, or fire escape ladder, no wall sign shall be permitted to project above the roof or parapet wall.

(c) **Construction.** Every wall sign shall be of the same period of fire resistance as that required for the exterior wall to which the sign is attached, or such sign may be constructed of incombustible materials, approved plastic material, or 1½ inch nominal thickness wood. Signs constructed of approved plastics or 1½ inch nominal thickness wood shall be separated from the interior of the building by the exterior wall. <

(d) **Sign Area.** > The total sign area of all wall signs on any wall shall not exceed 10% of the area of the wall to which the sign is attached.

EXCEPTIONS: 1. Sign area for signs painted on the wall of a building shall not be limited.

2. The total sign area for signs may equal 30% of the area of that portion of the wall less than 26 feet above grade.

That portion of signs constructed of wood and extending more than 12 feet above grade shall not cover an area exceeding 10% of that portion of the exterior wall extending above 12 feet. <

SEC. 91.5206 — ROOF SIGNS

(a) **Access.** Passages clear of all obstructions shall be left under or around all signs exceeding a height of four feet above the roof thereunder or immediately adjacent thereto. There shall be one such passage or access opening for each building covered, and at least every 50 feet in the length of the sign, and when such signs are at right angles to a face of the building, within 20 feet of parapet or exterior walls. Such passages shall be not less than three feet wide and four feet high and shall be at the parapet or roof level.

(b) **Height.** No roof sign on a Type II, III, IV or V building or structure shall exceed a height of 30 feet above the top of the parapet nearest the sign or above the highest point of the roof directly under the sign, in case there is no parapet. On a Type I building, no roof sign shall extend more than 30 feet above the top of the parapet nearest the sign or above the highest point of the roof directly under the sign unless the height of the building is more than 30 feet, in which case the height of the sign above the roof shall not exceed 50 feet. On any roof sign, letters, figures, characters or representations in cutout or irregular form may be maintained in conjunction with, attached to, or superimposed upon any solid roof sign, but shall not extend more than 15 feet above the height limit of the sign. The total surface area of the solid portion of such letters, figures, characters or representations in cutout or irregular form extending above the top molding of the solid roof sign shall not exceed 30% of the total area of the surface sign space of the solid roof sign; provided, further, that the total surface area of the solid portion of any one individual letter, figure, character or representation in cutout, or irregular form extending above the top molding of the solid roof sign shall not exceed 10% of the total area of the surface sign space of the solid roof sign.

EXCEPTIONS: *Roof signs on one-story buildings may be constructed of wood not less than ¾-inch thick or plywood not less than ½-inch thick, provided:*

1. No portion of the sign extends more than four feet above the roof directly below; and

2. If any portion of the sign is within four feet of the street side of the building, a six-foot, unobstructed passage must be maintained at each end of the sign and at least every 50 feet in the length of the sign.

(c) **Projection.** Roof signs may project beyond the face of the building, at right angles to the face of the building, if such projection complies with the provisions of the Code for projecting signs.

(d) **Construction.** Roof signs shall be designed as required in Section 91.5202.

They shall be of incombustible material, or approved plastics.

EXCEPTIONS: *1. Wood mouldings and two-inch thick plank walkways may be used.*

2. Cutouts may be ¾-inch waterproof plywood or masonite with wood backing or framing.

3. The sign facing may be mounted on wood frame panels with the panels in turn connected to wood runners that are bolted to an incombustible frame.

Blocks, angles or supports fastened to the roof shall be so located as not to interfere with the drainage of the roof, and where necessary, flashing or counterflashing shall be placed.

SEC. 91.5207 — MARQUEE AND CLOTH SIGNS

(a) **Marquee Signs.** Signs may be placed on, attached to, or constructed in a marquee, and such signs shall, for the purpose of determining projection, clearance and height meet the requirements for a marquee as specified in Section 91.4509. Materials shall be incombustible or approved plastics. Projecting signs attached to a building may also be attached to a marquee.

(b) **Cloth and Banner Signs.** Cloth and banner signs shall be strongly constructed and securely attached flat against the building. They shall be removed within 60 days after erection. Cloth signs and banners shall be flameproofed as required by the Fire Department, if the aggregate area exceeds 100 square feet on the face of the building.

SEC. 91.5208 — OUTDOOR ADVERTISING STRUCTURES AND ADVERTISING STATUARIES IN FIRE DISTRICT NO. 2

In Fire District No. 2 no outdoor advertising structure or advertising statuary shall be located nearer to the street than the point on the front exterior wall of the building nearest to the outdoor advertising structure or advertising statuary.

EXCEPTION: *An outdoor advertising structure or an advertising statuary erected between buildings on separate lots may be set back in line with a straight line drawn from the front exterior wall of one building to the front exterior wall of the other building. The line shall be drawn between those points on the front exterior walls which are nearest the outdoor advertising structure or advertising statuary.*

SEC. 91.5209 — OUTDOOR ADVERTISING STRUCTURES.

(a) **Height.** The lowest portion of the surface sign space, or the molding of an outdoor advertising structure, whichever is lower, shall be no more than eight feet above the ground level on which the outdoor advertising structure is erected. The surface sign space shall not exceed 10 feet six inches in height. Molding not exceeding two feet in width may be placed along the top and bottom of the surface sign space. On any outdoor advertising structure, letters, figures, characters or representations in cutout or irregular form may be maintained in conjunction with, attached to or superimposed upon the outdoor advertising structure, but shall not extend more than 5½ feet above the top of the upper molding. The total area of such cutouts shall not exceed that permitted for roof signs in Section 91.5206(b).

EXCEPTIONS: 1. If the ground level upon which the outdoor advertising structure is erected is below the level of the street or sidewalk on which the outdoor advertising structure faces, the lowest portion of either the surface sign space or molding may be eight feet above the level of such street or sidewalk.

2. On lots or premises used as automobile parking lots, automobile service stations, automobile sales lots or drive-in stands, the lowest portion of either the surface sign space or the molding of the outdoor advertising structure may be in excess of eight feet but shall not exceed 10 feet six inches above the ground level on which the outdoor advertising structure is erected. If the ground level upon which the advertising structure is erected is below ground level of the street or sidewalk on which the outdoor advertising structure faces, the lowest portion of either the surface sign space or the molding may be 10 feet six inches above the level of such street or sidewalk.

3. If the full length of the advertising structure is built parallel to and against the wall of a building, then the lowest portion of either the surface sign space or the moulding may be in excess of eight feet, but shall not exceed 15 feet above the ground level on which the outdoor advertising structure is erected. If the ground level upon which the advertising structure is erected is below the level of the street or sidewalk on which the outdoor advertising structure faces, the lowest portion of either the surface sign space or the moulding may be 15 feet above the level of such street or sidewalk.

(b) **Ornamental Lattice Work.** The space between the sign space and the ground may be enclosed with ornamental lattice work or louvers or solid facing running the entire length of the outdoor advertising structure. Subpilasters or similar ornamental brackets may be placed between the sign space and the ground.

(c) **Construction.** The framework or standards upon which an outdoor advertising structure is erected and the ornamental moldings, pilasters, bulkheads, lattice work, letters, figures, characters, representations or devices in cutout or irregular form may be of wood. The surface of the sign space shall be of metal or other incombustible material or approved plastics.

EXCEPTION: Outside of Fire District No. 1 the surface sign space may be of wood or other combustible material provided that all portions of the outdoor advertising structure are at least six feet from any other structure or building constructed of wood or other combustible material.

SEC. 91.5210 — ADVERTISING STATUARY

(a) **Height.** An advertising statuary shall not exceed 10 feet six inches in height.

(b) **Construction.** An advertising statuary shall be constructed of incombustible material or approved plastics.

SEC. 91.5211 — POST SIGNS.

(a) **Height.** The lowest portion of the sign of any post sign shall be a minimum of eight feet above ground level. No portion of any post sign shall exceed 42 feet above ground level.

EXCEPTIONS: 1. Cutouts as permitted for roof signs in Section 91.5206(b) may extend above the 42 foot limitation.

2. Post signs not exceeding 50 square feet shall not be limited to the 42 foot maximum height.

(b) **Construction.** The sign of every post sign shall be constructed as required for roof signs in Section 91.5206 (d). The supports for every post sign shall be of incombustible material. A maximum of three posts shall be permitted for any post sign.

EXCEPTIONS: 1. More than three posts will be permitted provided a minimum of six foot clear spacing is maintained between the posts.

2. A post sign not exceeding 50 square feet in area, not in Fire District No. 1, and a minimum of 15 feet from any other post sign may be constructed entirely of combustible material.

(c) **Projections.** A post sign may project over a building line provided such projection complies with Table No. 52-B of this Code.

EXCEPTION: Post signs constructed of combustible materials shall not project more than 30 inches over a building line.

SEC. 91.5212 — SUBDIVISION ADVERTISING STRUCTURES.

Notwithstanding any provision of Article 2 of Chapter 1 of the Los Angeles Municipal Code to the contrary, permits may be issued authorizing the erection and maintenance, for a period not to exceed one year, of outdoor advertising structures used exclusively for the purpose of advertising the subdivision upon which they are placed. No such structure shall exceed 30 feet in length, and not more than two such structures shall be maintained upon the same side of any one street in any one subdivision. No permit issued pursuant to this section shall be renewed, nor shall any new application be accepted for the same sign or the same subdivision. The permit shall not be issued until the final map of the subdivision involved has been duly recorded in the Office of the County Recorder in the manner required by law. No such permit shall be issued unless the subdivision involved is at least five acres in area and divided into at least 15 lots.

SEC. 91.5213 — BALLOONS

Balloons used for advertising purposes are regulated by Section 28.10 and 28.11 of the Los Angeles Municipal Code.

DIVISION 53 — TOURIST CAMPS, TRAILER PARKS

(Repealed)

DIVISION 54 — RELOCATION PERMIT

SEC. 91.5401 — SCOPE

No person shall relocate or cause to be relocated any building or structure into or within the City of Los Angeles without complying with the provisions of this division and all applicable provisions of Chapters 1 and 9 of this Code.

SEC. 91.5402 — HOUSE-MOVERS—PERMITS—CONDITIONS

(a) **Board of Public Works—Permission Required.** No person shall move any building or structure, or any portion thereof, over, upon, along or across any street without a written permit therefor from the Board of Public Works. Such permit may be referred to as a "House-mover's Permit" and shall be issued under the provisions of Section 62.84 of the Los Angeles Municipal Code.

(b) **Department of Building and Safety—Permit Required.** No "House-Mover's Permit" shall be issued until the Department of Building and Safety has first issued, to the owner or person having legal control of the premises to which the building is to be moved, a permit to relocate the particular building upon those premises. Such permit shall be called a "Relocation Permit."

(c) **Department of Building and Safety—Sewer Capping Permit Required.** No House-Mover's Permit shall be issued until the Department of Building and Safety has first issued to the owner of the premises from which the building is to be removed or demolished a permit to provide a water-tight cap to the house connection sewer at the property or sewer easement line.

SEC. 91.5403 — PERMIT—APPLICATION—PLANS AND SPECIFICATIONS

(a) Every application to the Department of Building and Safety for a Relocation Permit shall be in writing upon a form furnished by that Department and shall set forth such information as that Department may reasonably require in order to carry out the purposes of this Division.

(b) Each such application shall be signed by the person owning or having legal control of the site upon which the building or structure is to be relocated, and prior to any appeal or the issuance of any permit there shall be filed fully delineated working drawings, electrical and mechanical plans and complete specifications. Such working drawings, plans and specifications shall show all new construction, materials, fixtures and fittings and any alterations, repairs or additions to be made to existing construction. Such plans shall also include floor plans, elevations and necessary construction details so as to show conformity with the intent of this ordinance. Such drawings, plans and specifications shall, in addition to the requirements of Section 91.0210 of this Code, show all site preparation, grading and improvements.

The applicant shall assume all responsibility for the preparation and completeness of said plans. In the event the City elects to

complete the building or to demolish the building under the provisions of the Municipal Code, the City reserves the right to interpret errors or omissions or supply missing information on the plans. The City shall not be responsible for the performance of the work done under any contract entered into to complete or demolish the building.

The lot from which a building is moved shall be cleared of all debris resulting from such removal, the footings and foundation walls shall be removed to grade and the lot shall be graded as necessary to provide drainage to a street gutter or other approved location.

SEC. 91.5404 — PERMIT — WILL NOT BE ISSUED WHERE CERTAIN CONDITIONS EXIST

(a) No permit shall be issued to relocate any building or structure:

1. Which is so constructed or in such condition as to be dangerous, or which is infested with pests or is unsanitary.

2. Which, if it be a dwelling, is unfit for human habitation, or which is so dilapidated, defective or in such condition of deterioration or disrepair that its relocation at the proposed site would cause appreciable harm to or be materially detrimental to the property or improvements in the neighborhood within a radius of 1,000 feet from the proposed site.

3. If because of age, size, design or architectural treatment the building does not substantially conform to the general design, plan and construction of the buildings located in the neighborhood within a radius of 1,000 feet from the proposed site so that its relocation would be materially detrimental to the property or improvements in said neighborhood.

4. If the proposed use is prohibited by the zoning laws of the City; or

5. If the structure is of a type prohibited at the proposed location by any Fire District regulation, or by any other law or ordinance.

EXCEPTION: If the Department of Building and Safety finds that the condition of the building or structure is such that practicable and effective repair is possible, the permit may be issued upon such conditions as said Department may determine are required to comply with the provisions and intent of this Division.

(b) If the unlawful, dangerous or defective condition of the building or structure proposed to be relocated is such that remedy of correction cannot practicably and effectively be made, the permit shall be denied.

(c) The Department of Building and Safety shall, in granting any Relocation Permit, impose thereon such terms and conditions as it may deem reasonable and proper, including, but not limited to, the requirement of changes, alterations, additions or repairs to be made to or upon the building or structure, to the end that the relocation thereof will not be materially detrimental or injurious to public safety or to public welfare or to the property and improvements, or either, in the district, as hereinabove limited, to which it is to be moved.

(d) The terms and conditions upon which each permit is granted shall be written upon the permit or appended in writing thereto.

SEC. 91.5405 — PERMIT—INVESTIGATION

(a) In order to determine any of the matters presented by the application, the Department of Building and Safety may cause to be made any investigation required in the discretion of the Department.

(b) If the Department shall deem it necessary or expedient, it may request the Board of Building and Safety Commissioners to set such application for hearing, and cause such notice of the time, place and purpose thereof to be given as the Board may deem appropriate. Hearings shall be conducted as prescribed in Article 8, Chapter 9, of the Los Angeles Municipal Code. The findings of said hearings shall be reported to the Superintendent of Building for his consideration.

SEC. 91.5406 — GUARANTEE OF COMPLETION REQUIRED

No Relocation Permit shall be issued unless the applicant therefor shall first post with the Department of Building and Safety a bond in an amount equal to the cost of the work required to be done, plus an additional 25 per cent, guaranteeing compliance with all conditions of the permit and completion of all work described in the plans and specifications therefor, as estimated by the Department of Building and Safety. The applicant may post either a surety bond or cash bond or negotiable United States Treasury Certificates of the kind approved by law for securing deposits of public money. The bond shall be executed by the applicant as principal, and if a surety bond, shall also be executed by a corporation authorized to act as surety under the laws of the State of California, as surety. The bond shall be a joint and several obligation; and shall be conditioned upon the faithful performance of all terms and conditions of the permit and of all work described in the plans and specifications therefor to the satisfaction of the Department of Building and Safety. The bond shall contain the further conditions that should the applicant fail to complete all such work within the time specified on the permit, the City may, at its option, cause all of such work to be done or completed in accordance with the terms and conditions of the permits and the plans and specifications therefor on file with said Department, or demolish the building. The parties executing the bond shall be firmly and continually bound for the payment of all the costs necessary to complete the work or demolish the building under all terms and conditions of said bond. Such cost shall include, in addition to the cost to complete the work or demolish the building, an amount equal to ten per cent of such cost to cover the cost to the City of administering the contract and supervising the work required. Whenever the applicant elects to deposit cash or approved negotiable United States Treasury Certificates, the City shall be authorized in the event of any default on the part of the applicant to use any or all of the cash or approved negotiable certificates to cause the work to be done and for the payment of all costs thereof. The term of the bond shall begin on the date of the deposit of the cash or negotiable certificates or the filing of the surety bond, and shall end upon the date of the completion to the satisfaction of the said Department of all such work. The fact of such completion shall be evidenced by a written statement thereof signed by the Superintendent of Building and thereafter the cash deposit or certificate shall be returned to the applicant, or the surety bond released, as the case may be. Whenever the City elects to have such work done because of the applicant's default, the amount of the deposit or certificates in excess of all cost of such work shall be returned to the applicant after the work has been so approved.

EXCEPTION: No bond need be posted in any case where the

Department shall determine that the only relocation involved is that of moving a building temporarily to the regularly occupied business premises of a house-mover, or that of moving a building to adjacent property of the same owner. The exceptions herein made shall not apply unless the Department further finds that no such security is necessary in order to assure compliance with the requirements of this Section.

SEC. 91.5407 — PERMITS—ISSUANCE

Every relocation permit issued under the provisions of this Section shall contain each and every term and condition imposed by the Department of Building and Safety; shall be valid for a period not to exceed 120 days, unless extended by said Department or by the Board, in case an appeal is made to it under Section 98.0403, and shall become null and void without further notice or order upon the expiration of such time or any extension thereof, or upon any default in the performance of any of the aforesaid terms or conditions.

SEC. 91.5408 — DEFAULT IN PERFORMANCE OF CONDITIONS OR TERMS OF PERMITS—FAILURE TO COMPLETE

(a) Whenever the Department of Building and Safety finds that a default has occurred in the performance of any term or condition of a relocation permit, or upon the failure of the applicant to complete the work required thereby or as described in the plans and specifications therefor within the time prescribed, the Department shall give notice to the applicant and to the surety, if any, to complete the work or perform the condition within a specified additional time, not to exceed 60 days. Such notice shall be served upon the applicant and the surety, if any, by certified mail; and shall be deemed to have been so served when placed in the United States mail, postage prepaid and addressed to such person. No person shall fail or refuse to comply with such notice. However, such notice may be complied with by demolishing and removing the building or structure and restoring the site within the time prescribed, at the option of the applicant or the surety, as the case may be.

(b) If the applicant or the surety fails or refuses to comply with any such notice within the time prescribed, the Department shall cause the building or structure to be demolished or the work to be completed, whichever it shall determine is reasonable under the circumstances, without further notice or order. In determining whether to demolish the building or structure or whether to complete the work the Department shall consider the condition of the building at the time of the failure or refusal to comply with said notice, the cost to complete the work required, the sufficiency of the bond to cover such costs, and whether, in the interest of safeguarding the public health, safety or welfare, it is reasonable in light of all the circumstances to complete the work. If it is not reasonable to complete the work in light of all such circumstances the said Department shall demolish the building. The cost of completing the work or demolishing the building, including the 10 per cent administration and supervision cost, shall be paid for out of the cash deposit or negotiable United States Treasury Certificates posted with said Department, or from the Repair and Demolition Fund, if no such deposit or certificate has been posted. All sums used for such purposes out of the Repair and Demolition Fund shall be recovered from the surety under the surety bond provided for hereinabove. Any work to be performed by the Department under the provisions of this section shall be done in accordance with the

established public works practices of the City of Los Angeles. If the Department shall use any money in the Repair and Demolition Fund for the completion or demolition of any building under the provisions of this section, the Department shall notify the surety thereof, and the surety shall immediately thereafter reimburse the City of Los Angeles therefor under the surety bond. The City Attorney is authorized to and shall institute any action necessary to the recovery of such money under the surety bond provided for hereinabove.

SEC. 91.5410 — PERMIT-EXCEPTION

The foregoing provisions of this division shall not apply where the building or structure is to be moved to a point outside the limits of the City of Los Angeles. In such cases, the written permit to move the building on a public street shall be secured from the Board of Public Works and the permit to provide the watertight cap on the sewer connection shall be secured from the Department.

SEC. 91.5411 — RELOCATION PERMITS — FEES

(a) Before any application for a Relocation Permit is accepted, a fee shall be paid by the applicant of the cost to the City of the investigation of the condition of the building to be moved and the inspection of the proposed new location. The amount of the fee shall be as follows for each main building or for the first accessory building where no main building is to be relocated.

BASIC RELOCATION APPLICATION FEE SCHEDULE

Floor Area of Building	Fee
➤ 0 - 2500 square feet	\$185.00
2501 - 5000 square feet	285.00
5001 - 7500 square feet	330.00
7501 - 10,000 square feet	410.00
Each additional 10,000 square feet	105.00◀

Where an accessory building, in addition to a main building or the first accessory building where no main building is to be moved, is to be relocated from the same location to the same site at the new location, an application fee of ➤ \$35.00 ◀ shall be paid for each such accessory building.

(b) In the case of a building located outside the City limits of the City of Los Angeles, an additional fee of ➤ \$185.00 shall be paid for each application. In addition to the fee, a mileage charge of 45 cents per mile ◀ shall be paid for any inspection which is made ten miles or more beyond City limits. Mileage shall be measured in a straight line from the point ten miles beyond the City limits which is nearest to the location of the building to be inspected, to the location of the building, and return to said point of departure.

(c) The application fees required by Subsections (a) and (b) of this Section shall be in addition to the regular building permit fee required by Section 91.0204.

(d) Should a relocation permit be denied by the Department solely because the proposed relocation site is not approved, the applicant may, with the consent of the Department, file within six months of the date of the original application an amended application for approval of a new proposal site. An additional fee of ➤ \$45.00 ◀ for each such amended application will be charged. If a relocation permit is not obtained within six months after the original application fee is paid, a new application shall

be filed and a new application fee paid before the relocation permit may be issued.

(e) The provisions of this subsection shall not apply to the relocation of temporary buildings or structures to be used by a governmental agency for a governmental purpose.

SEC. 91.5412 — ENTRY UPON PREMISES

(a) The Superintendent of Building, the surety, and the duly authorized representatives of either, shall have access to the premises described in the relocation permit for the purpose of inspecting the progress of the work.

(b) In the event of any default in the performance of any term or condition of the relocation permit, the surety, or any person employed or engaged on its behalf, or the Superintendent of Building, or any person employed or engaged on his behalf, shall have the right to go upon the premises to complete the required work or to remove or demolish the building or structure.

(c) It shall be unlawful for the owner or his representatives, successors or assigns, or any other person, to interfere with or obstruct the ingress or egress to or from any such premises of any authorized representative or agent of any surety or of the City engaged in the work of completing, demolishing or removing any building or structure for which a relocation permit has been issued after a default has occurred in the performance of the terms or conditions thereof.

DIVISION 61 — PLASTICS

SEC. 91.6101 — GENERAL

(a) **Material.** Plastic materials permitted elsewhere in this Code shall comply with the requirements of this Division.

(b) **Approval for Use.** The Superintendent of Building shall require that sufficient technical data be submitted as he may consider relevant to the nature and proposed use of the plastic material. Upon the analysis of the data furnished, the Superintendent of Building shall determine the adequacy of the material offered; and if finding the material satisfactory for the use intended, he may approve the material, subject to such limitation as he deems necessary to meet the purpose of this Code.

(c) **Identification.** Each sheet, roll or piece of plastic for which a building permit is required shall be identified with a mark or decal satisfactory to the Superintendent of Building.

(d) **Fabrication.** No plastic materials to which the provisions of this Division are applicable shall be used unless produced by a Type I Fabricator to whom an approval has been issued pursuant to Division C, Article 6, Chapter IX of the Los Angeles Municipal Code.

SEC. 91.6102 — APPROVED PLASTICS

Approved plastic materials shall be those (1) which burn no faster than $2\frac{1}{2}$ inches per minute in sheets 0.060 inch thick when tested in accordance with ASTM D-635 — "Standard Method of Test for Flammability of Self-Supporting Plastics" or has a flame spread no greater than 225 when tested in accordance with ASTM E-84 — "Standard Method of Test for Surface Burning Characteristics of Building Materials" tested in the thickness and in the way intended to be constructed in use; (2) which have a smoke developed rating no greater than 450 when tested in accordance with ASTM E-84 in the way intended for use or a smoke density rating no greater than 75 when tested in the thickness intended for use in accordance with ASTM D-2843 — "Standard Method for Measuring the Density of Smoke from the Burning or Decomposition of Plastics;" (3) which have a self-ignition temperature of 650°F or greater when tested in accordance with ASTM D-1929 — 68; and (4) the products of combustion for which are no more toxic than those of untreated wood when burned under similar conditions.

SEC. 91.6103 — INSTALLATIONS

(a) **Structural Requirements.** All plastic materials and their assemblies shall be of adequate strength and durability to withstand the design loads as prescribed elsewhere in this Code. Sufficient and substantial technical data shall be submitted to the Superintendent of Building by an approved testing agency to establish stresses, maximum unsupported spans, and such other information as may be deemed necessary by the Superintendent of Building for the various thicknesses and forms used.

(b) **Fastenings.** Fastenings shall be adequate to withstand design loads as prescribed elsewhere in this Code. Proper allowance shall be made for expansion and contraction of plastic materials in accordance with accepted data on coefficient of expansion of the material and any material in conjunction with which it is employed.

DIVISION 67 — SECURITY PROVISIONS

SEC. 91.6701 — PURPOSE

The purpose of this Division is to provide a nominal level of resistance to unlawful entry of buildings by establishing minimum standards of construction and hardware for the closure of openings regulated by this Division.

SEC. 91.6702 — GENERAL

In every Group G, H, and R Occupancy, the openings regulated by this Division shall be completely secured in accordance with the provisions specified herein.

EXCEPTION: The requirements of this Division shall not apply to:

1. *Detached buildings which are accessory to Group R-1 Occupancies.*

2. *Group G Occupancies which, by the nature of their operation, are unenclosed.*

3. *Group G Occupancies where the owner submits written notice to the Department of intent to substitute security personnel and/or site security installations in lieu of requirements of this Division. Such exemption shall be subject to the concurrence of the Department and shall be one of the conditions upon which the Certificate of Occupancy is issued.*

SEC. 91.6703 — LIMITATIONS

The provisions of this Division shall not be applicable to latching or locking devices on exit doors which would be contrary to the provisions of Division 33 or Division 49, nor shall the regulations of this Division be construed to waive any other provision of this Code.

➤ Whenever any metal bars, grills, grates or similar products manufactured to preclude human entry through windows and exterior doors are sold within the City, a notice in at least 10-point bold type reading as follows shall be attached to each such product: "A building permit is required in most cases for the installation of this product and if installed in a sleeping room, unless excepted by the provisions of either Section 91.1303(b) or 91.1402(d) of the Los Angeles Municipal Code, must be equipped with a quick-release latch openable from inside and the dwelling unit provided with an approved smoke detector." ◀

SEC. 91.6704 — ALTERNATE SECURITY PROVISIONS

The provisions of this Division are not intended to prevent the use of any device, hardware, or method of construction, not specifically prescribed in this Division, when such alternate provides equivalent security and is approved by the Department.

SEC. 91.6705 — DEFINITIONS

For the purpose of this Division, certain terms are defined as follows:

Cylinder Guard. A ring surrounding the exposed portion of the lock cylinder, or any other device which is so fastened as to protect the cylinder from wrenching, prying, cutting, or pulling by attack tools. The ring shall be made from steel or brass and shall have a minimum taper of 15 degrees.

Deadlocking Latch. A latch in which the latch bolt is positively held in the projected position by a guard bolt, a plunger or an auxiliary mechanism.

Deadbolt. A bolt which has no automatic spring action and which is operated by a key cylinder, thumb-turn, or lever, and is held fast when in the projected position.

Latch. A device for automatically retaining a door, upon its closing, in a closed position.

Security Opening. An opening in a wall, partition, or roof when such opening occurs in any of the following locations:

1. In an exterior wall and less than 16 feet above the grade

of any adjoining yard, court, passageway, public way, walk, breezeway, patio, planter, porch or similar area.

2. In an exterior wall and less than 16 feet above the surface of any adjoining roof, balcony, landing, stairtread, platform, or similar structure when that surface is accessible to the public or another tenant or when any portion of such surface is itself less than 16 feet above an accessible grade.

3. In the enclosing partitions of a dwelling unit, private garage, guestroom or single-tenant non-residential area.

4. In a roof when any portion of such roof is less than 16 feet above an accessible grade or surface accessible by another tenant or the public.

SEC. 91.6706 — ENTRY VISION

In residential occupancies, all entry doors to dwelling units or guest rooms shall be arranged so that the occupant has a view of the area immediately outside the door without opening the door. Such view may be provided by a door viewer, through windows located in the vicinity of the door, or through view ports in the door or adjoining wall. ➤ Such windows or view ports shall be constructed in compliance with the provisions of Section 91.6720 of this Division. ◀

SEC. 91.6707 — APPURTENANT ACCESS

Buildings located within 8 feet of utility poles or similar structures which could otherwise be used to gain access to the building's roof, balcony or similar surfaces shall have access to such building surfaces protected by screens, barricades or fences made of materials which preclude human climbing. Such protection shall extend to where the surfaces are more than 8 feet from the pole or access structure.

SEC. 91.6710 — DOORS - GENERAL

Every door in a security opening shall be constructed, installed, and secured as set forth in Sections 91.6711, 91.6712, 91.6713 and 91.6714. Glazing indoors shall comply with Section 91.6720.

SEC. 91.6711 — SWINGING DOORS

(a) ➤ Swinging wooden doors, openable from the inside without the use of a key and which are either of hollow core construction or less than 1- $\frac{1}{2}$ inches in thickness, shall be covered on the inside face with 16 gage sheet metal attached with screws at six (6) inch maximum centers around the perimeter or equivalent. Glazing in doors shall be as set forth in Section 91.6720. ◀

(b) A single-swinging door, the active leaf of a pair of doors, and the bottom leaf of Dutch doors shall be equipped with a deadbolt and deadlocking latch. The deadbolt and latch may be activated by one lock or by individual locks. Deadbolts shall contain hardened inserts to repel cutting tools. The lock or locks shall be key-operated from the exterior side of the door and openable from the interior side by a device which does not require a key, special knowledge, or special effort to operate.

EXCEPTION: 1. The latch may be omitted from doors in Group G Occupancies.

2. In other than residential buildings, locks may be key operated on the inside when not prohibited by the provisions of Division 33.

3. A swinging door greater than 5 feet in width may be secured as set forth in Section 91.6713.

A straight deadbolt shall have a minimum throw of one inch and an embedment of not less than $\frac{1}{2}$ inch into the holding device receiving the projected bolt. A hook-shaped or an expanding-lug deadbolt shall have a minimum throw of $\frac{3}{4}$ inch. All deadbolts of locks which automatically activate two or more deadbolts shall embed at least $\frac{1}{2}$ inch into the holding devices receiving the projected bolts.

(c) The inactive leaf of a pair of doors and the upper leaf of Dutch doors shall be equipped with a deadbolt or deadbolts as set forth in Subsection (b).

EXCEPTION: 1. The deadbolt or bolts need not be key operated, but shall not be otherwise activated from the exterior side of the door.

2. The deadbolt or bolts may be engaged or disengaged automatically with the deadbolt or by another device on either the active leaf or the lower leaf.

3. Manually-operated hardened bolts at the top and bottom of the leaf which embed a minimum of $\frac{1}{2}$ inch into the receiving device may be used when not prohibited by Division 33.

(d) Door stops of in-swinging doors shall be of one-piece construction with the jamb, or joined by rabbet to the jamb.

(e) All pin-type hinges which are accessible from outside the secured area when the door is closed shall have non-removable hinge pins. In addition, such hinges shall have jamb studs which project through both hinge leaves and prevent removal of the door if the pin is removed from the hinge. Jamb studs shall be not less than $\frac{1}{4}$ inch diameter steel and shall project into the door and jamb not less than $\frac{1}{4}$ inch.

EXCEPTION: Jamb studs are not required for hinges which are shaped to prevent removal of the door if the hinge pin is removed.

(f) Cylinder guards shall be installed on all mortise or rim-type cylinder locks whenever the cylinder projects beyond the face of the door or is otherwise accessible to gripping tools.

(g) In wood construction, the strike plate for latches shall be secured to the jamb with screws and the holding device for projecting dead bolts shall be secured to the jamb and wall framing with at least two screws not less than $2\frac{1}{2}$ inches in length which penetrate the wall framing. In aluminum construction, the strike plate and deadbolt holding device shall be secured in an area of reinforced heavy gage jamb material.

SEC. 91.6712 — SLIDING GLASS DOORS

Sliding glass doors shall be equipped with locking devices and shall be so constructed and installed that they remain intact and engaged when subjected to the tests specified in Section 91.6731. Cylinder guards shall be installed on all mortise or rim-type cylinder locks whenever the cylinder projects beyond the face of the door or is otherwise accessible to gripping tools. A device shall be installed in the upper channel of the moving panel to prohibit raising and removal of the moving panel from the track while in the closed position.

SEC. 91.6713 — OVERHEAD AND SLIDING DOORS

Metal or wooden overhead and sliding doors shall be secured with a cylinder lock, padlock with a minimum 9/32" diameter hardened steel shackle and bolted, hardened steel hasps, metal slide board, bolt or equivalent device unless secured by an electrical power operation.

Cylinder guards shall be installed on all mortise or rim-type cylinder locks whenever the cylinder projects beyond the face of the door or is otherwise accessible to gripping tools.

SEC. 91.6714 — METAL ACCORDION-GRATE OR GRILLE-TYPE DOORS

Metal accordion-grate or grille-type doors shall be equipped with metal guides at the top and bottom and cylinder locks or padlocks having minimum 9/32" hardened steel shackles with hardened steel hasps, bolted in place. Cylinder guards shall be installed on all mortise or rim-type cylinder locks whenever the cylinder projects beyond the face of the door or is otherwise accessible to gripping tools.

SEC. 91.6720 — GLAZED OPENING—GENERAL

All windows, skylights, glazing in doors or other glazing in security openings shall conform to ➤ this section and to the applicable requirements of Sections 91.6721, 91.6722 and 91.6723.

Glazed openings within 40 inches of the required locking device of the door, when said door is in the closed and locked position and when said door is openable from the inside without the use of a key, shall be fully tempered glass, conforming to the provisions of Section 91.1711(d), or approved burglary resistant material, or shall be protected by metal bars, screens or grills having a pattern such that the maximum dimension of any opening does not exceed two inches.

EXCEPTION: The provisions of this section shall not apply to sliding glass doors which conform to the provisions of Section 91.6718 of this Division or to view ports or windows which do not exceed two inches in their greatest dimension.◀

SEC. 91.6721 — GLAZING

In Group G Occupancies, panes of glazing with a least dimension greater than six inches, but less than 48 inches, shall be constructed of fully tempered glass or approved burglary resistant material or shall be protected by metal bars or grills which are constructed to preclude human entry. ➤ Such bars or grills shall have a pattern such that no less than one dimension or any opening shall be six inches or less.◀

SEC. 91.6722 — WINDOWS

(a) Sliding glass windows shall be provided with locking devices and shall be so constructed and installed that they remain intact and engaged when subjected to the tests specified in Section 91.6732. A device shall be installed in the upper channel of the moving panel to prohibit the raising and removal of the moving panel from the track while in the closed or partially open position.

(b) Other openable windows shall be provided with substantial locking devices which render the building as secure as the devices required by this section. In G Occupancies, such devices shall be glide bars, bolts, cross bars and/or padlocks with minimum 9/32" hardened steel shackles and bolted, hardened steel hasps.

(c) Special. Louvered windows shall be protected by metal bars or grills which are constructed to preclude human entry. ➤ Such bars or grills shall have a pattern such that no less than one dimension of any opening shall be six inches or less.

(d) Any release for metal bars, grills, grates or similar devices constructed to preclude human entry that are installed shall be located on the inside of the adjacent room and at least 24 inches from the closest opening through such metal bars, grills, grates or similar devices that exceeds two inches in any dimension.

EXCEPTION: Metal bars, grills, grates or similar devices may be padlocked in position where such padlocks or similar devices are not prohibited by law.◀

SEC. 91.6723 — OPENINGS OTHER THAN DOORS OR GLAZED OPENINGS

(a) Security openings other than doors or glazed openings shall be protected in accordance with the requirements of this Section.

(b) Hatchway covers of less than 1½ inch thick solid wood construction shall be covered on the inside with 16 gauge sheet metal attached by screws around the perimeter spaced at 6-inch maximum centers.

(c) Hatchway covers shall be secured from the inside with slide bars, slide bolts, and/or padlocks with hardened steel shackles. Hasps shall be hardened steel and bolted.

(d) Outside pin-type hinges shall be provided with non-removable pins.

(e) ➤ Openings within 40" of the required locking device of the door when said door is in the closed and locked position and when said door is openable without the use of a key

shall not exceed two inches in their greatest dimension or shall be protected by metal bars or grills having a pattern such that the openings of which do not exceed two inches in the greatest dimension.

(f) All other openings shall be protected by metal bars or grills constructed to preclude human entry. Such bars or grills shall have a pattern such that no less than one dimension of any opening shall be six inches or less.

EXCEPTION: Openings which are more than 40 inches from the required locking device of a door in the closed and locked position when the door is openable from the inside without the use of a key, and which do not exceed 96 square inches in area, with no less than one dimension thereof being six inches or less.

SEC. 91.6730 — TESTS - GENERAL

Doors, windows, and similar closures of security openings regulated by the provisions of this Division, including the frames, jambs, hardware and locking devices of such closures, shall be shown to satisfactorily pass the tests specified in this Division. The tests shall be performed by an approved testing laboratory on the units as installed at the job site or installed in test assemblies constructed according to the manufacturer's details. Each typical job installation shall be tested or the units shall be constructed and installed in conformance to a General Approval issued by the Department.

SEC. 91.6731 — TESTS - SLIDING GLASS DOORS

Panels shall be closed and locked. Tests shall be performed in the following order:

(a) Test A. With the panels in the normal position, a concentrated load of 300 pounds shall be applied separately to each vertical pull stile incorporating a locking device at a point on the stile within 6 inches of the locking device in the direction parallel to the plane of glass that would tend to open the door.

(b) Test B. Repeat Test A while simultaneously adding a concentrated load of 150 pounds to the same area of the same stile in a direction perpendicular to the plane of glass toward the interior side of the door.

(c) Test C. Repeat Test B with 150 pound force in the reverse direction towards the exterior side of the door.

(d) Tests D, E, and F. Repeat Tests A, B, and C with the movable panel lifted upwards to its full limit within the confines of the door frame.

(e) Movable panels shall not be rendered easily openable or removable from the frame during or after the tests or the panel shall have failed the test.

SEC. 91.6732 — TESTS - SLIDING GLASS WINDOWS

Sash shall be closed and locked. Tests shall be performed in the following order:

(a) Test A. With the sliding sash in the normal position, a concentrated load of 150 pounds shall be applied separately to each member incorporating a locking device at a point on the sash member within six inches of the locking device in the direction parallel to the plane of glass that would tend to open the window.

(b) Test B. Repeat Test A while simultaneously adding a concentrated load of 75 pounds to the same area of the same sash member in the direction perpendicular to the plane of glass toward the interior side of the window.

(c) Test C. Repeat Test B with the 75 pounds force in the reversed direction towards the exterior side of the window.

(d) Tests D, E, and F. Repeat Tests A, B, and C with the movable sash lifted upwards to its full limit within the confines of the window frame.

(e) Movable panels shall not be rendered easily openable or removable from the frame during or after the tests or the panel shall have failed the test.

APPENDIX

Numerical Index For Rules Of General Application

Rules of General Application are supplementary to the code and are listed below. The text of most of the rules is printed in the "Index Of Materials, Equipment, Methods And Rules," published by the City of Los Angeles and which may be purchased from the Supply Officer of the Department of Building and Safety, Room 498, Los Angeles City Hall, 200 No. Spring St., Los Angeles, California 90012. Telephone (213) 485-3767.

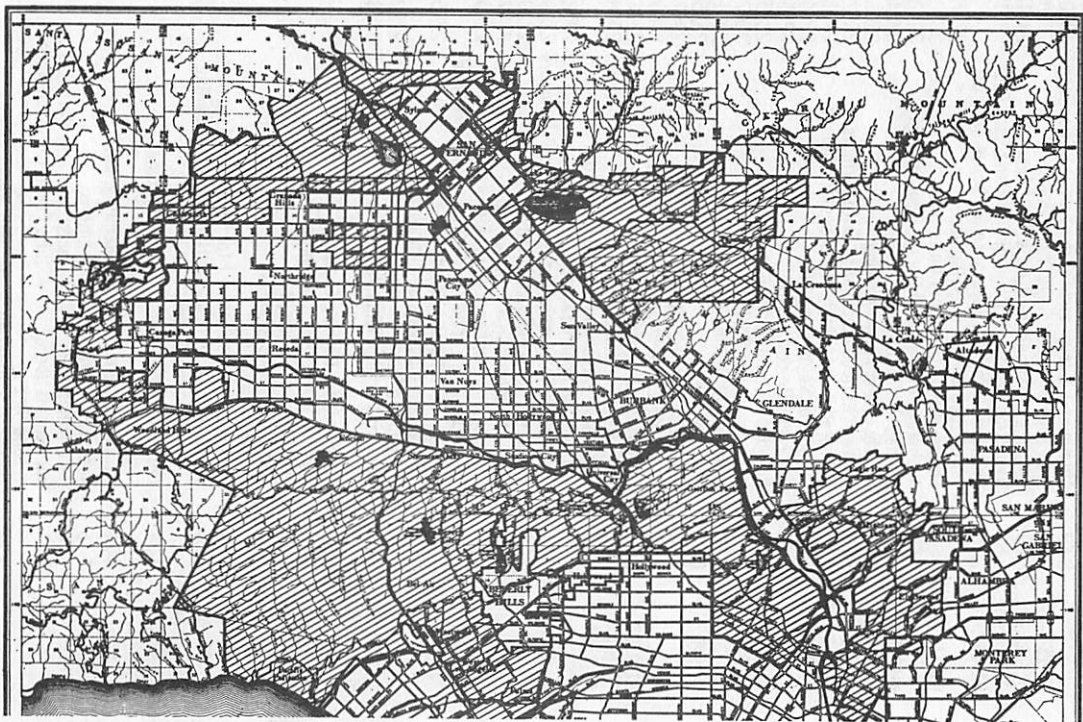
All rules are available for review at various offices of the Department in Los Angeles City Hall and also at the district and branch offices.

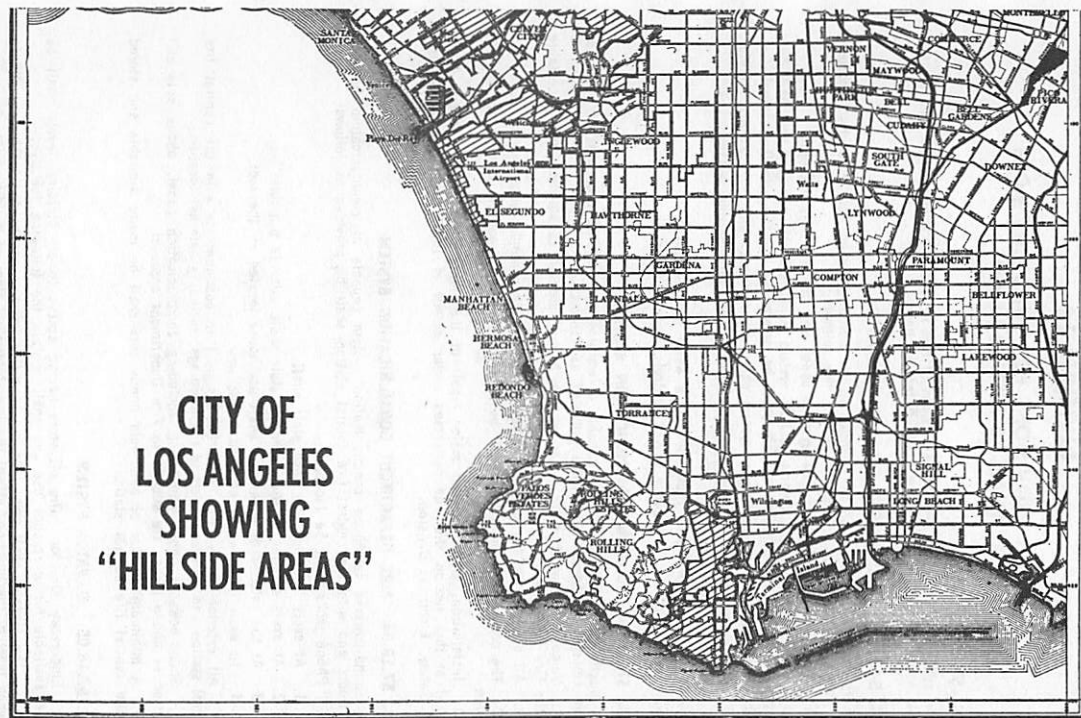
CODE SECTION	RGA NUMBER	TITLE	RESEARCH NUMBER
91.0315(b)	657	Occupancy Change—Structural Requirements	22745
AISC 1.11.4	659	Welded Steel Studs—Composite Construction	23117
91.2702(b)7			
91.0501	6510	Mausoleums and Columbariums	22824
91.2514(a)	661	Rotation of Wood Diaphragms	22829
91.2305(k)7	662	Pile and Caisson Ties	22869
91.4301	6-66	Fire Testing of Steel Columns	23242
91.1603(h)	7-66	Shake and Shingle Fire Retardant Treatment	22940
91.2306(e)	1-67	Strong Motion Accelerographs	23201
91.3002(b)	4-67	Supervision on Hillside Tract Grading	23352
91.3002(a)	5-67	Hillside Exploratory Work	23353
91.2309	14-67	Design and Construction—Swimming Pools	23387
91.1709(e)	2-68	Rules—Conventions, Shows, Tents	23264
91.4305(d)	5-68	Omission of Protection Behind Electrical Boxes	22755
91.0210(b)	6-68	Computer Solutions	23429
91.4703	7-68	Omissions of Corner Reinforcement	2157
91.1711(d)	9-68	Testing and Quality Standards—Safety Glass	22886
91.4901(g)	10-68	Electrical, Plumbing, Heating—Existing Residential Buildings	23441
91.2604.2.4	12-68	2000 PSI Concrete Mix for Pump Use	22959
91.0102	13-68	Design and Construction of Tanks and Supports for Pressure Vessels	2127
91.2618	14-68	Power Driven Steel Studs in Prestressed Concrete Elements	23460
91.0502(i)	15-68	Boarding Homes for the Clergy	22757
91.2701(a)1	16-68	Tapered Steel Beams—Construction Bracing	22815
91.0311(d)	18-68	Special Deputy License Qualification for Prestressed Concrete Inspection	23467
91.2306(m)	19-68	Earthquake Design—Inverted Pendulum Type Structures	22832
91.2510(g)	20-68	Standards for Testing and Evaluation of Joist Hanger and Similar Joist Devices	22810
91.0502(c)	21-68	Child Care Centers	22844
91.4919(c)	22-68	Roman Type Depressed Tubs—Minimum Requirements	3382
91.4304	2-69	Reinforcement to Prevent Spalling—Prestressed Concrete Members	23486

Numerical Index For Rules Of General Application

(Continued)

CODE SECTION	RGa NUMBER	TITLE	RESEARCH NUMBER
91.3202(a)	4-69	Omission of Roofing on Prestressed Concrete Roofs	23506
	8-69	Aluminum—Design and Fabrication Specifications	23503
91.2807(d)	9-69	Pole Supported Buildings (Wood Poles)	23505
91.2616.3	13-69	Height Limitations for Precast Wall Panels	23518
91.0209(e)	15-69	Definition of Site for Determining Plan Check Fees	23519
91.4809(b)	17-69	Reduced Underfloor Clearance for Conversion of Attached Garage to Living Area	22872
91.2419(d)	18-69	Screen Walls of Masonry Units	22096
	20-69	Anchorage of Overhead Garage Door Springs	23526
AISC 1.10.5	21-69	Welded Girder Stiffeners	22846
91.4908(e)	22-69	Nonabsorbent Floor Coverings	22052
91.3304	23-69	Nurses' Stations Adjacent to Exit Corridors	23527
91.4930.1(c)	24-69	Approved Sink for Light Housekeeping Rooms	22914
91.2607.3	26-69	Support of Reinforcing Steel in Concrete Slabs	22746
	27-69	Concrete Proportioning	23555
91.4813(b)	31-69	Plywood Water Repellent Joints	22858
91.2306(a)	33-69	Knee Bracing of Roof Trusses	22078
	4-70	Licensing of Testing Agencies	22915
91.5202(i)	6-70	Freeway Signs	23350
	7-70	Fabricators of High-Strength Steel	23070
	8-70	Handrails and Guardrails for Bleachers	23605
91.0203	2-71	Occupancy During Construction	22988
91.1104	4-71	Exits from Service Stations	23000
91.2701(a)	6-71	Light Gage Structural Steel Ordered to Chemical Specification	22787
	7-71	Fabrication Tolerances for Built-up Steel Members	22890
	8-71	Fire Tests of Steel Beam Sections	22394
TABLE 23-C	9-71	Seismic Factor "K" = 1; Shear Wall Construction	22875
	10-71	Plywood Grading Agency Regulations	22306
91.0506(j)	11-71	Alternate Construction for Wood Framed, Two-Hour Division Walls and Parapets	22761
	12-71	Allowable Projections and Improvements in Required Yards	22820
91.2305(o)}	14-71	Dwellings in High Wind Velocity Areas	22682
91.4801(a)}	3-72	Standards for Parking Facilities	
	4-72	Mezzanine Floors in Residential Buildings	
91.4405(e)	1-73	Demolition of Buildings	
	2-73	Standards of Acceptability for Structural Steel Plates and Shapes	
	1-74	Refund of Excess Payment for Permits and Licenses	
91.0502(h)}	2-74	Standard Sound-Rated Partitions and Floor-Ceiling Construction System	
91.4903(h)}			
91.3302 }	3-74	Tenant Corridors in Multi-Story Buildings	
91.3304 }			
91.4705	4-74	Ceiling Suspension System Requirements	
	1-75	Approved Fabricators Regulations	
	1-76	Determination of the Characteristic Site Period, Ts	
	1-77	Implementation of the Alquist-Priolo (Fault) Studies Zone Act	
	2-78	Welder Certification Rules and Regulations	
	3-77	Welding of Reinforcing Steel	





Excerpts From Los Angeles City Fire Code

(Article 7 of Chapter 5, Los Angeles Municipal Code)

CITY OF LOS ANGELES ORDINANCE NO. 145,432 (Effective March 2, 1974, Operative July 29, 1974)

DIVISION 18

SPECIAL PROVISIONS FOR BUILDINGS MORE THAN 75 FEET IN HEIGHT

SEC. 57.18.01. SCOPE:

In addition to all other applicable portions of this Article, the provisions of this Division shall apply to all buildings more than 75 feet in height.

SEC. 57.18.02. CENTRAL FIRE CONTROL STATION:

A fire control station shall be provided in the building design and in location approved by the Fire Department. It shall contain the following:

- A. The building communication system panel and the controls therefor.
- B. The Fire Department communication system panel controls therefor and hand-held phone sets. The number of phone sets shall be determined by the Fire Department.
- C. The fire detection and alarm system panels, annunciator and the controls therefor.
- D. The status indicators and controls for elevators and air-handling systems.
- E. A public telephone.
- F. Sprinkler valve status indicator and a water flow indicator.
- G. Standby power, emergency power controls and indicators.

SEC. 57.18.03. BUILDING COMMUNICATION SYSTEM:

A public communication system capable of warning the building occupants of a fire or other emergency condition shall be provided as follows:

- A. Voice communication or other system having similar capabilities and acceptable to the Fire Department.
- B. All areas of the building shall be covered by the communication system.
- C. The communication system shall be subject to control from the central fire control station.
- D. Installation, alteration and major repair of the items listed in Subsections A, B and C of this section shall be performed under permit of the Department of Building and Safety, Electrical Division.

SEC. 57.18.04. FIRE DEPARTMENT COMMUNICATION SYSTEM:

A sound-powered telephone communication system capable of communication between all floors and with the central fire control station shall be provided as follows:

- A. Phone jacks shall be located:
 1. At every floor level in each stair shaft.
 2. At every exterior location where a stair shaft exits to a public way.
 3. At the exterior of each stair shaft penthouse located on the roof.
 4. In each lobby which exits to public way.
- B. All exterior phone jacks shall be designed to communicate with the central fire control station and all other levels of the buildings, including external locations.
- C. Sound-powered phone equipment, including communication panel, phone sets and location of phone jacks, are subject to Fire Department approval.
- D. A minimum number of hand-held phone sets shall be made available and stored at the central fire control station.

SEC. 57.18.05. ELEVATOR SYSTEM:

A. Emergency Elevator. The elevators having access to all building levels shall be made available for emergency use and shall contain the following features:

1. The elevator shall open into a 1-hour fire resistive constructed lobby or vestibule at each level of the building, except the lowest terminal floor of building entry.
2. The elevator shall be subject to control from the central fire control station.
3. The elevator shall be interconnected with the standby power system.

B. Fire Control Elevator. 1. One elevator in each bank of elevators shall be designated for Fire Department use and shall have its controls so modified that a key switch located in the central fire control station will recall said elevator to the building level where the central fire control station is located.

2. The elevator shall be interconnected with the standby power.

C. **Special Requirements.** Except as provided herein, elevators shall conform to the requirements of Article 51, Title 19, California Administrative Code.

D. Installation, alteration and major repair of the items listed in Subsections A and B of this section shall be performed under permit of the Department of Building and Safety, when a permit is required by that Department.

SEC. 57.18.06. FIRE ALARM SYSTEM:

A dependable method of sounding an alarm of fire throughout the building shall be provided. Manual pull stations shall be located in the corridor on each building level adjacent to stair shafts. Sounding devices shall be clearly audible throughout the building. Bells or building communication system may be used as a sounding device. Installation, alteration and major repair of the fire alarm system shall be performed under permit of the Department of Building and Safety, Electrical Division.

SEC. 57.18.07. EMERGENCY SMOKE CONTROL SYSTEM:

A building smoke control system shall be provided and so designed to detect any smoke in the building air-handling system and cause an alarm to be annunciated at the central fire control station. Installation, alteration and major repair of the smoke control system shall be performed under permit of the Department of Building and Safety. In addition, the following capabilities shall be provided:

A. The air-handling equipment shall be subject to control from the central fire control station.

B. Smoke ejection from the building shall be accomplished by one of the following methods:

1. Building air-handling equipment designed for this purpose may be used, provided such system, under fire conditions, exhausts at a rate of not less than 6 changes of air per hour from the floor involved and the system exhausts directly to the exterior of the building without recirculating to other sections of the building. Such system shall have controls that will provide this capability for any floor.

2. Openable windows in the exterior wall on each floor of the building. Such venting facilities shall be provided at the rate of 20 square feet per 50 lineal feet of exterior wall in each story and distributed around the perimeter at not more than 50-foot intervals. Such windows shall be clearly identified as required by the Fire Department.

SEC. 57.18.08 — STANDBY POWER AND EMERGENCY POWER

A. Standby Power:

1. A permanently installed on-site standby power generation system, consisting of one or more generators, including the prime mover, shall be provided. In the event of failure of the normal source of electric service, the standby power generation system shall provide an alternate source of electrical energy to serve at least the designated power loads set forth in Subdivision 2 of this subsection.

2. **Power Loads.** The power load requirements for sizing the standby power generation shall include, but not necessarily be limited to, the following:

- a. Exit signs and exit illumination.
- b. Elevator car lighting.
- c. Fire alarm system.
- d. Fire detection system.
- e. Sprinkler alarm system.
- f. Electric driven fire pumps.
- g. Building communication system.
- h. Smoke control system.
- i. Elevators designated for Fire Department use.
- j. Lighting circuits supplying elevator lobbies, the central fire control station, and the generation room.

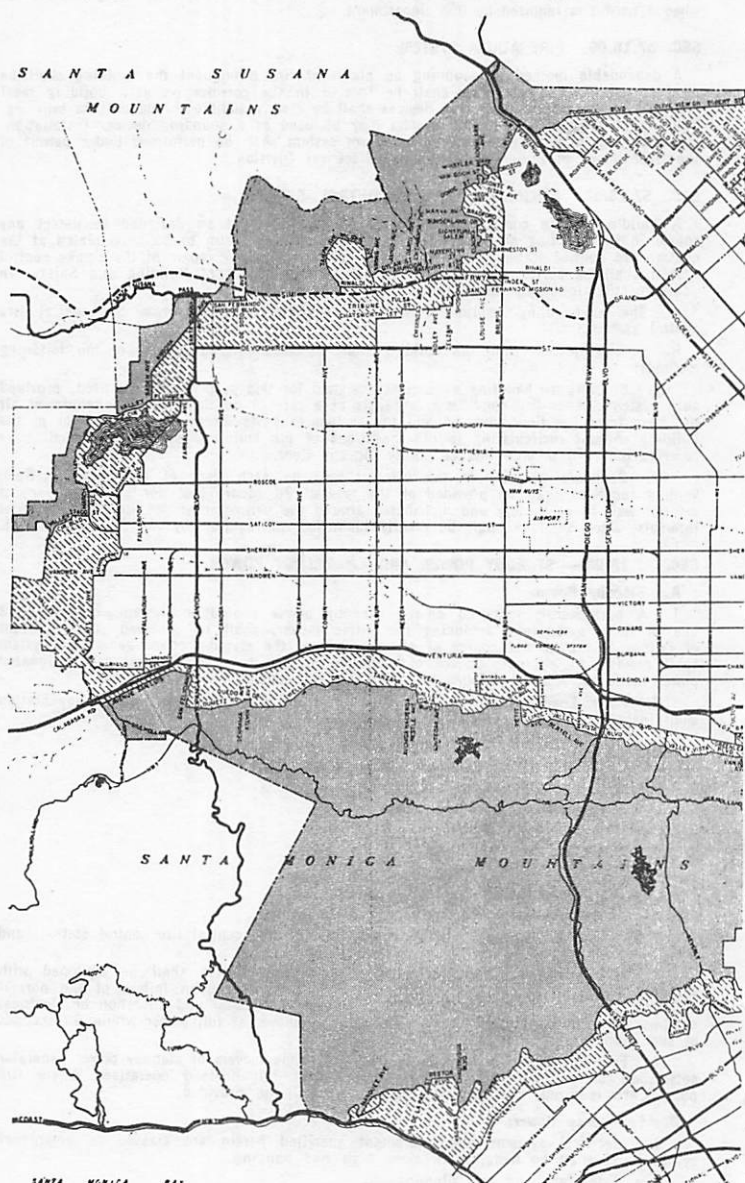
3. **Transfer Time.** The standby power generation system shall be equipped with suitable means for automatically starting the generator set upon failure of the normal electrical service, and shall provide for the automatic transfer and operation of electrical systems and equipment specified in Subdivision 2 above, at full power within 60 seconds of such normal service failure.

4. **Fuel Supplies.** On-site fuel supplies for prime movers of standby power generator sets shall be sufficient for at least 6 hours at full demand operation. Where fire pumps are required, and 8-hour fuel supply shall be provided.

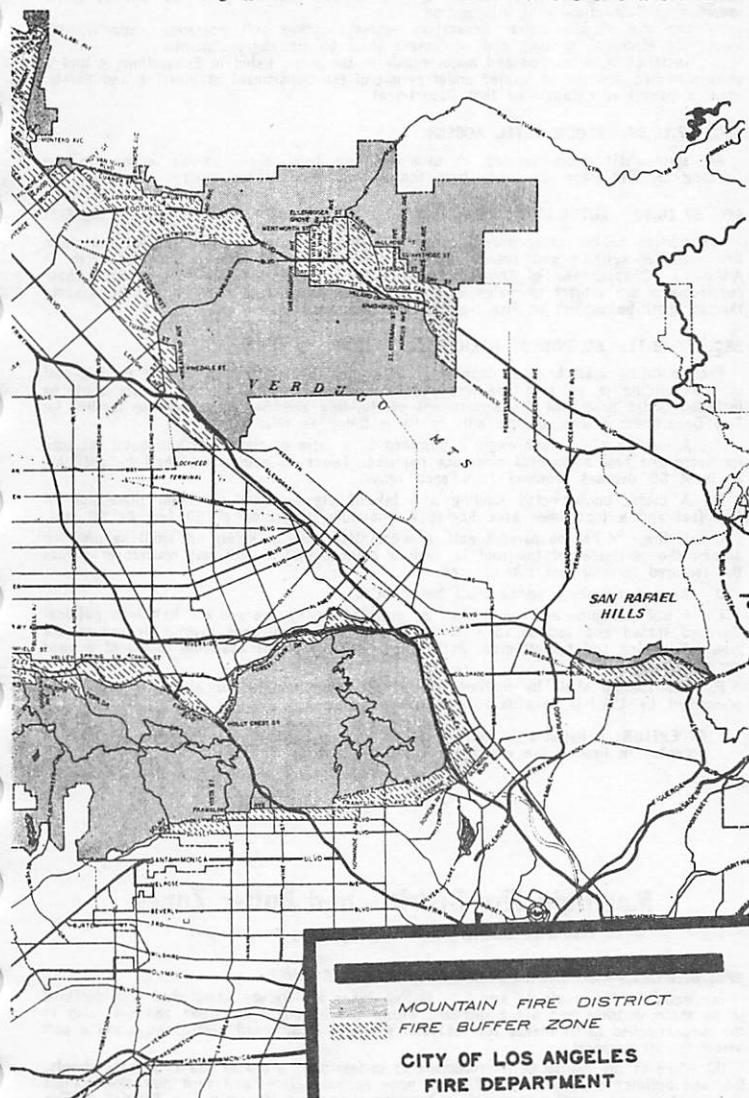
B. Emergency Power:

1. Electrical systems and equipment specified herein are classed as emergency systems and shall be installed in every high rise building.

- a. Exit signs and exit illumination.
- b. Elevator car lighting.
- c. Fire alarm system.



S A N G A B R I E L M O U N T A I N S



- d. Fire detection system.
- e. Sprinkler alarm system.

2. **Transfer Time.** The emergency power supply system shall be so designed, that upon failure of the normal electrical service the emergency Subdivision 1 above shall be automatically transferred and operated within 10 seconds of such normal service failure. Such emergency power supply system may be separate from the standby power specified in Subsection A of this section.

When the standby power generation system reaches full operating capacity, the emergency electrical systems and equipment shall be transferred thereto.

C. Installation, alteration and major repair of the items listed in Subsections A and B of this section shall be performed under permit of the Department of Building and Safety, when a permit is required by that Department.

SEC. 57.18.09. FLOOR LEVEL ACCESS:

All stair shaft doors located at each building level shall provide access to the building for Fire Department use from the stairway side of the shaft.

SEC. 57.18.10. AUTOMATIC FIRE SPRINKLER SYSTEM AND PRESSURIZED STAIR SHAFTS:

In addition to the other provisions of this Division, the requirements for automatic fire sprinkler systems and pressurized stair shafts shall be provided as set forth in Article 1, Chapter IX, of the Los Angeles Municipal Code (Building Code). These requirements are subject to review by the Fire Department, and any modification granted thereto shall be subject to Fire Department concurrence.

SEC. 57.18.11. EMERGENCY HELICOPTER LANDING FACILITY:

Each building shall have an emergency helicopter landing facility located on the roof of the building in an area approved by the Department. The landing facility shall be installed under permit of the Department of Building and Safety. A landing facility for Fire Department emergency use only to be installed as follows:

A. A landing glide slope angle determined by a ratio of eight feet horizontal distance for every one foot of vertical clearance required. Two such approaches shall be available at least 90 degrees removed from each other.

B. A clear, unobstructed landing and takeoff area with a minimum dimension of 100 feet and a touchdown area having a minimum dimension of 50 feet by 50 feet.

C. If the roof has no parapet wall, a substantial fence or safety net shall be provided around the perimeter of the roof in such a manner that it will not restrict or reduce the required landing and takeoff area.

D. A wind-indicating device shall be provided.

E. A wet standpipe and outlet shall be provided having one and one-half inch national standard thread and located in such a manner that it will not restrict or reduce the required landing and takeoff area. Sufficient pressure shall be available to afford a good fog pattern.

F. The rooftop shall be marked by an emergency marker for elevated surfaces as prescribed by L.A.F.D. Standard No. 54.

EXCEPTION: A helistop or heliport as defined in L.A.F.D. Standard No. 54 may be accepted in lieu of the emergency landing facility.

Mountain Fire Districts and Buffer Zones

(See Fire District Maps on Preceding Two Pages)

SEC. 57.25.01 — MOUNTAIN FIRE DISTRICTS ESTABLISHED

(a) Mountain Fire Districts and Fire Buffer Zones are hereby established and declared to be those districts and areas included within the boundary described and set forth in the map attached to Ordinance No. 141,685 which is incorporated herein and made a part hereof for all purposes.

(b) When in the course of improvement of undeveloped areas of the City, new streets, lots and building sites are created where none existed before, and such new streets, lots and building sites overlap the existing boundary line of a Mountain Fire District or Fire Buffer Zone, the boundary line of such district or zone shall be deemed to be relocated along the center line of such newly created streets that lie closest to the original boundary line location.

(c) The Chief Engineer shall by regulation establish a legal description of all Mountain Fire Districts and Fire Buffer Zones. Such regulations shall be amended from time to time to reflect changes necessitated by Subsection (b) hereof or for other necessary purposes. Every such regulation of the Chief Engineer shall be established according to the requirements of Section 57.01.34 of this Article.

Excerpts From Los Angeles Elevator Code

(Article 2 of Chapter 9, Los Angeles Municipal Code)

SEC. 92.1001 — ENCLOSURES OF HOISTWAYS

(a) **Fire-Resistive Construction.** Where hoistways are required to be enclosed throughout their height in a fire-resistive enclosure, the construction requirements for the enclosure shall comply with the provisions of Divisions 17 and 43 of the Los Angeles Building Code.

EXCEPTION: Sidewalk elevator hoistways having not more than two landings.

(b) **Non-Fire-Resistive Enclosures.** Where fire-resistive hoistway enclosures and doors are not required, the hoistway shall be fully enclosed. Enclosures shall be building walls, solid partitions, grille work, metal grating or wood. The openings in the grille work or between vertical boards may be not larger than two inches wide and not more than 24 inches in length. Elevators installed prior to June, 1939, hoistway enclosures shall be enclosed on all sides to the height of not less than six feet above each landing except for the necessary entrances. All non-fire-resistive hoistway enclosures shall be so supported and braced as to deflect not over one inch when subjected to a force of 100 pounds applied horizontally at any point.

(c) **Multiple Hoistways.** Where four or more elevators serve all or the same portion of a building, they shall be located in not less than two hoistways; and in no case shall more than four elevators be located in any one hoistway.

(d) **Strength of Enclosure.** The hoistway enclosure adjacent to a landing opening shall be of sufficient strength to support in true alignment the hoistway doors with their operating mechanism and locking device.

SEC. 92.1002 — CONSTRUCTION AT TOP AND BOTTOM OF HOISTWAY

(a) **Hoistways Extending Into the Top Story.** Where a hoistway extends into the top story of a building, fire-resistive hoistway or machinery-space enclosures, where required, shall be carried to the underside of the roof if the roof is of fire-resistive construction, and at least three feet above the top surface of the roof if the roof is of non-resistive construction.

(b) **Hoistways Terminating Below the Top Story.** Where a hoistway does not extend into the top story of a building, the top of the hoistway shall be enclosed with fire-resistive construction having a fire-resistive rating at least equal to that required for the hoistway enclosures.

EXCEPTION: Sidewalk elevator hoistways located entirely outside the building with the top opening located in the sidewalk or other area exterior to the building.

(c) **Construction At Bottom Of Hoistway.** Pits extending to the ground shall have non-combustible floors and shall be so designed as to prevent entry of ground water into the pit. The pit floor of any hoistway not extending to the ground shall be of fire-resistive rating at least equal to that required for the hoistway enclosure. Car and counterweight buffers supports shall be of sufficient strength to withstand without failure the impact resulting from buffer engagement at governor tripping speed or at 125 per cent of rated speed where no governor is provided.

SEC. 92.1006 — PROJECTIONS, RECESSES AND SETBACKS IN HOISTWAY ENCLOSURES OF POWER ELEVATORS

(a) **On Sides Used For Loading and Unloading.** Landing sills, hoistway doors, door tracks and hangers may project inside the general line of the hoistway.

(b) **On Sides Not Used For Loading and Unloading.** Recesses other than for windows or recesses necessary for installation of equipment, shall not be permitted. Beams, floor slabs or other building construction shall not project more than two inches inside the general line of the hoistway unless the top surface of the projection is beveled at an angle of not less than 60 degrees with the horizontal. Where setbacks occur in the enclosure wall, the top of the setback shall be beveled at an angle of not less than 60 degrees with the horizontal. Separator beams between adjacent elevators are not required to have bevels.

SEC. 92.1011 — ENCLOSURE OF MACHINE ROOMS AND MACHINERY SPACES FOR ELEVATORS AND DUMBWAITERS

(a) **Enclosures Required For Power Elevators Having Fire-Resistive Hoistway Enclosures.** Spaces containing machines, control equipment, sheaves and other machinery shall be enclosed with fire-resistive enclosures. Enclosures and access doors thereto shall have a fire-resistive rating at least equal to that required for the hoistway enclosure. The necessary openings may be provided in machine room floor and secondary slab for the operation of cables, tapes and other equipment essential for the elevator operation.

(b) **Enclosures Required For Power Elevators Having Non-Fire-Resistive Hoistway Enclosures.** Enclosure of spaces containing machines, control equipment, sheaves and other machinery shall be of incombustible material not less than six feet high. If of openwork material the enclosure shall reject a ball two inches in diameter.

SEC. 92.1013 — ACCESS TO MACHINE ROOMS AND MACHINERY SPACES

(a) **General Requirements.** A permanent, safe and convenient means of access to elevator and dumbwaiter machine rooms and overhead machinery spaces shall be provided for authorized persons.

(b) **Access Across Roofs.**

1. A stairway shall be provided from the top floor of the building to the exit door at

the roof level. Stairways shall meet the requirements set forth in Division 33 of the Los Angeles Building Code.

2. Where the passage is over a sloping roof having a slope exceeding 15 degrees from the horizontal, an unobstructed, permanent and substantial stairway not less than 24 inches wide, equipped on at least one side with a standard railing not less than 42 inches high, shall be provided from the building exit door at the roof level to the means of access to the machine room or machinery spaces.

(c) Requirements For Means Of Access.

1. Where the floor of the machine room or of the machinery space, or where the distance between machine-room levels is more than eight inches above or below the floor or roof from which the means of access leads, metal stairs or ladders shall be provided between such levels.

2. Where the difference in level is not more than four feet a vertical ladder with hand grips may be provided.

3. Except as provided in Subsection above, stairs having a maximum angle of 60 degrees from the horizontal shall be provided, and shall be equipped with a metal handrail on all open sides.

4. A metal platform shall be provided at the top of the stairs with metal railings on each open side. The size of the platform shall be sufficient to permit the full swing of the door plus two feet from the top of the riser to the swing line of the door. The floor of the platform shall be at the level or not more than eight inches below the level of the access-door sill. Where the door swings inward the width of the platform shall be not less than 30 inches in length and not less than the width of the door.

5. Handrails and railings shall conform to the Safety Code for Floors and Wall Openings, Railings and Toe Boards, ASA Standard A12-32.

(d) Access Doors. Access doors to machine rooms and overhead machinery spaces shall be self-closing and provided with locks arranged to permit the door to be opened from inside without a key. Such doors shall be kept closed and locked except during periods when a qualified attendant is on duty in the room or space. Minimum size of access door to be not less than 30 inches wide and six feet eight inches high.

EXCEPTION: Dumbwaiter access doors shall require Departmental approval.

SEC. 92.1014 — HEAD ROOM IN MACHINE ROOMS AND OVERHEAD MACHINERY SPACES OF POWER ELEVATORS

Elevator machine rooms and machinery spaces not located over the hoistway shall have a head room of not less than seven feet. Where a floor is provided at the top of the hoistway, elevator machine rooms and overhead machinery spaces above such floor shall have a clear head room of not less than the following:

1. Machine, control and motor-generator rooms, seven feet.

2. Spaces containing only secondary or deflecting sheaves, four feet.

3. Spaces containing overhead, secondary or deflecting sheaves, and governors, signal machines or other equipment, four feet six inches.

Where floors are provided under secondary and deflecting sheaves, the machine and supporting beams may encroach on the required head room provided there is a clearance of not less than three feet between the underside of such beams and the top of the floor.

SEC. 92.1022 — INSTALLATION OF PIPES AND DUCTS CONVEYING GASES, VAPORS OR LIQUIDS IN HOISTWAYS

Pipes or ducts conveying gases, vapors, or liquids, and not used in connection with the operation of the elevator or dumbwaiter, shall not be installed in any hoistway.

EXCEPTION: Sprinklers approved by the Department and properly guarded may be installed in the elevator pits.

SEC. 92.1061 — PITS FOR POWER ELEVATORS

(a) Where Required. A pit covering the entire area of the hoistway shall be provided for every power elevator.

(b) Design and Construction Of Pits. The construction of the pit walls, the pit floor and any pit access doors shall conform to Sections 92.1001 through 92.1006 and 92.1061d. The floor of the pit shall be approximately level.

EXCEPTIONS: 1. Trenches or depressions may be provided for the installation of buffers, compensating sheaves and frames, and vertical sliding biparting hoistway doors where structural conditions make such trenches or depressions necessary.

2. Where new elevators are installed or existing elevators are altered in existing buildings, existing foundation footings extending above the general level of the pit floor may remain in place provided the maximum encroachment of such footings does not exceed 15 per cent of the cubic content of the pit and further provided that it is impracticable to remove the footing.

3. Sumps with or without pumps may be installed in the elevator pits where used for seepage water only.

(d) Access To Pits. Safe and convenient access shall be provided to all pits, and shall conform to the following:

1. Access may be by means of the lowest hoistway door or by means of a separate pit access door.

2. Access to pits extending four feet or more below the sill of the pit access door shall be provided by means of fixed vertical ladders of incombustible material, located

within reach of the access door. The ladder shall extend not less than 36 inches above the sill of the access door, or hand-grips shall be provided to the same height.

3. Vertical ladders shall not be permitted in pits having depth of more than 12 feet below the lowest hoistway door sill. A separate access door shall be provided for pit access.

4. Pits shall be accessible only to authorized persons.

Where a separate pit access door is provided, it shall be self-closing and provided with a spring-type lock arranged to permit the door to be opened from inside of the pit without a key. Such door shall be kept locked.

5. When the means of determining the oil level of the car or counterweight buffers is located more than seven feet above the pit floor, a permanent steel platform and ladder shall be provided for inspection and maintenance of the buffer.

(g) **Minimum Pit Depth Required.** The pit depth shall be not less than is required for the installation of the buffers, compensating sheaves, if any, and all other elevator equipment located therein; and to provide the minimum bottom clearance and runby required by Section 92.1071(a).

A minimum of four feet shall be maintained from the floor of the lowest landing and the floor of the pit on all power elevators.

Excerpts From Los Angeles Electrical Code

(Article 3 of Chapter 9, Los Angeles Municipal Code)

SEC. 93.450-21 - DRY-TYPE TRANSFORMERS INSTALLED IN-DOORS. Single dry-type transformers installed indoors shall be completely enclosed except for ventilating openings, and have a separation of at least 12 inches from combustible material unless separated therefrom by a fire-resistant heat insulating barrier having a fire resistive time rating of not less than one hour as determined from Division 43 of the Los Angeles Building Code. Transformers rated more than 35,000 volts shall be installed in a vault. (See Sections 93.450-41 through 93.450-48 in this Division.)

SEC. 93.450-24 - OIL-INSULATED TRANSFORMERS INSTALLED INDOORS. Oil-insulated transformers shall be installed in a vault constructed as specified in this Division except as follows:

(a) **Not Over 112 and One-Half K.V.A. Total Capacity.** The provisions for transformer vaults specified in Sections 93.450-41 through 93.450-48 of this Division apply except that the vault may be constructed of reinforced concrete not less than four inches thick.

(b) **Not Over 600 Volts.** A vault is not required provided suitable arrangements are made where necessary to prevent a transformer oil fire igniting other materials, and the total transformer capacity in one location does not exceed 10 K.V.A. in a section of the building classified as combustible, or 75 K.V.A. where the surrounding structure is classified as fire-resistant construction.

(c) **Furnace Transformers.** Electric furnace transformers of a total rating not exceeding 75 K.V.A. may be installed without a vault in a building or room of fire-resistant construction provided suitable arrangements are made to prevent a transformer oil fire spreading to other combustible material.

(d) **Detached Buildings.** Transformers may be installed in a building which does not conform with the provisions specified in this Code for transformer vaults, provided neither the building nor its contents present a fire hazard to any other building or property, and provided the building is used only in supplying electric service and the interior is accessible only to qualified persons.

SEC. 93.450-25 - OIL-INSULATED TRANSFORMERS INSTALLED OUTDOORS. Combustible material, combustible buildings and parts of buildings, fire escapes, door and window openings shall be safeguarded

from fires originating in oil-insulated transformers installed on, attached to, or adjacent to a building or combustible material. Space separations, fire-resistant barriers, automatic water spray systems and enclosures which confine the oil of a ruptured transformer tank are recognized safeguards. One or more of these safeguards shall be applied according to the degree of hazard involved in cases where the transformer installation presents a fire hazard. Oil enclosures may consist of fire-resistant dikes, curbed areas or basins, or trenches filled with coarse crushed stone. Oil enclosures shall be provided with trapped drains in cases where the exposure and the quantity of oil involved are such that removal of oil is important.

SEC. 93.450-27 - INSTALLATION OF TRANSFORMERS ON ROOFS. Installations of transformers on roofs shall comply with the provisions of this Section.

(a) The structure of the building shall be of sufficient strength to carry the weight of the transformers, enclosures and related equipment.

(b) Dry-type and askarel-filled transformer installations shall comply with the applicable provisions of Sections 93.450-22 and 93.450-48, respectively.

(c) Oil-filled transformers shall be installed in vaults constructed as specified in Sections 93.450-24 through 93.450-48, inclusive.

EXCEPTIONS: Vaults need not be provided on roofs of buildings of Type I construction as specified in the Building Code where:

- 1. Transformers having exposed energized parts are protected by fences as specified in Section 93.450-26; and*
- 2. An enclosure having a curb not less than six inches in height and of adequate capacity to contain the oil of the largest transformer is installed; and*
- 3. Means are provided to remove or drain any oil or water which may accumulate within the curbed enclosure.*

C. PROVISIONS FOR TRANSFORMER VAULTS

SEC. 93.450-41 - LOCATIONS. Vaults shall be located where they can be ventilated to the outside air without using flues or ducts wherever such an arrangement is practicable.

SEC. 93.450-42 - WALLS, ROOF, AND FLOOR. The walls and roofs of vaults shall be constructed of reinforced concrete, brick, load bearing tile, concrete block, or other fire-resistive constructions which have adequate structural strength for the conditions, and a minimum fire resistance of three hours. The floors of vaults in contact with the earth shall be of concrete not less than four inches thick but when the vault is constructed with a vacant space or other stories below it, the floor shall have adequate structural strength for the load imposed thereon and a minimum fire resistance of three hours.

SEC. 93.450-43 - DOORWAYS. (a) **Type of Door.** Each doorway leading into a building shall be provided with a tight-fitting door. The Department enforcing this Code may require such a door for an exterior wall opening or on each side of an interior wall opening where conditions warrant.

(b) **Sills.** A door sill or curb of sufficient height to confine within the vault the oil from the largest transformer shall be provided and in no case shall the height be less than four inches.

(c) **Locks.** Entrance doors shall be equipped with locks, and doors shall be kept locked, access being allowed only to qualified persons. A permanent warning sign legible at 12 feet shall be posted on the door,

forbidding unauthorized persons to enter. Locks and latches shall be so arranged that the door may be readily and quickly opened from inside the vault.

SEC. 93.450-45 - VENTILATION OPENINGS. When required by Section 93.450-8, openings for ventilation shall be provided in accordance with the following:

(a) **Location.** Ventilation openings shall be located as far away as possible from doors, windows, fire escapes, and combustible material.

(b) **Arrangement.** Vaults ventilated by natural circulation of air may have roughly half of the total area of openings required for ventilation in one or more openings near the floor and the remainder in one or more openings in the roof or in the sidewalls near the roof; or all of the area required for ventilation may be provided in one or more openings in or near the roof.

(c) **Size.** In the case of vaults ventilated to an outdoor area without using ducts or flues the combined net area of all ventilating openings after deducting the area occupied by screens, gratings, or louvers, shall be not less than three square inches per K.V.A. of transformer capacity in service, except that the net area shall be not less than one square foot for any capacity under 50 K.V.A.

(d) **Covering.** Ventilation openings shall be covered with durable gratings, screens, or louvers, according to the treatment required in order to avoid safe conditions.

(e) **Dampers.** All ventilation openings to the indoors shall be provided with a three-hour fire protection assembly, as defined by Section 91.4307 of the Los Angeles Building Code, which operate in response to a vault fire.

(f) **Ducts.** Ventilating ducts shall be constructed of fire-resistant material.

(g) **Use of Ventilating Systems.** Vents from transformer vaults shall not open into any enclosed ventilating system which connects with any other portion of the building. Ventilation may be supplied from conditioned air systems to the vault, provided automatic dampers are installed in each supply opening to prevent the emission of smoke or fire.

(h) **Opening In Vault Door.** Ventilating openings shall not be through the vault door, except when the door opens to the outdoors.

SEC. 93.450-46 - DRAINAGE. Where practicable, vaults containing more than 100 K.V.A. transformer capacity shall be provided with a drain or other means which will carry off any accumulation of oil or water in the vault unless local conditions make this impracticable. The floor shall be pitched to the drain when provided.

SEC. 93.450-47 - WATER PIPES AND ACCESSORIES. Any pipe or duct systems foreign to the electrical installation should not enter or pass through a transformer vault. Where the presence of such foreign systems cannot be avoided, appurtenances thereto which require maintenance at regular intervals shall not be located inside the vault. Arrangements shall be made where necessary to avoid possible trouble from condensation, leaks and breaks in such foreign systems. Piping or other facilities provided for fire protection or for water-cooled transformers are not deemed to be foreign to the electrical installation.

SEC. 93.450-48 - STORAGE IN VAULTS. Materials shall not be stored in transformer vaults.

Excerpts From Los Angeles Plumbing Code

(Article 4 of Chapter 9, Los Angeles Municipal Code)

SEC. 94.21309 — PROHIBITED LOCATIONS

No water heater which depends on the combustion of a fuel for heat shall be installed: (a) In any room used or designed to be used for sleeping purposes, bathroom, clothes closet or other confined space opening into any bathroom or sleeping room, or under a stairway or landing where prohibited by other regulations.

EXCEPTION: Water heaters with sealed combustion chambers that are vented as provided in Section 94.21314(d).

(b) In any Group E, F-1, F-1P or J-1 Occupancy or other area where the presence of the flame in the water heater would be a hazard unless it is installed at least 4 ft above the floor level and at least 25 ft from any gasoline dispenser.

EXCEPTION: Water heaters, serving a single dwelling unit and located in a J-1 Occupancy that serves only that dwelling unit, may be installed a minimum of 24 in. above the floor level.

Editor's Note: For definitions of occupancies, see Building Code Sec. 91.0502.

SEC. 94.30332 — STANDPIPES

DEFINITIONS.

Standpipe. A wet or dry fire line installed exclusively for the fighting of fires, extending from the lowest to the top most story and through the roof of a building or structure, with hose outlets at every floor and roof and designed to operate at required working pressures.

Dry Standpipe. A standpipe fire line without a constant water supply, equipped with Fire Department inlet and outlet connections as required by Table 21 of this Section and installed primarily for Fire Department use. When supplying fire sprinklers, the dry standpipe has a constant water supply that is adequate for the fire sprinklers.

Wet Standpipe. An auxiliary vertical or horizontal fire line with constant water supply designed primarily for emergency use by occupants.

Combination Standpipes. A standpipe fire line having a constant water supply available in addition to the Fire Department inlet connections as required in Table 21 of this Section and installed primarily for Fire Department use. It shall also be equipped with outlet connections as required in Table 21. It may also serve the wet standpipe system when first approved by the Administrative Authority.

A. Dry and Combination Standpipes. 1. Location. (a) In every building requiring standpipes, there shall be one standpipe outlet at every floor-level and roof landing of every enclosed stairway, fire escape, or smoke tower. Every point shall be covered by a 30-ft. stream of water from the nozzle attached to 100 ft. of hose when connected to an outlet. All outlets shall discharge horizontally and shall be located a minimum of 24 in. and a maximum of 60 in. above the landings or roof. Roof outlets shall be provided on each riser extending through the roof, as shown in Table 21.

EXCEPTIONS: 1. Where acceptable to the Department, roof outlets need not be installed where the edge of the roof or top of parapet is not over 15 ft. above grade.

2. Outlets are not required on the first-floor level of any building or on any pent-house roof.

3. Roof outlets shall be located outside of the enclosure.

4. Roof outlets are not required on roofs sloping more than 1 vertically to 6 horizontally.

(b) **Exit Doors.** Outlets from dry or combination standpipes shall be placed so that exit doors will not interfere with their use..

Access. All outlets shall be readily accessible to the Fire Department.

Cabinet Doors. When outlets are located in a cabinet, the door shall be clearly labeled "STANDPIPE VALVE" in letters at least 3 inches in height. Any cabinet that can be locked shall have an opening with a pane of single-strength glass at least 7 in. high and as wide as the construction of the door will permit.

(c) **Working Clearance.** Each hose valve shall be so installed that:

1. A 12 in. long wrench may be rotated through a full circle when connecting the hose.

2. There is at least 12 in. clearance from obstructions all around the valve centerlines, at least 6 in. clearance above the valve handwheel in the extended position and at least 1 in. clearance around the rim of the valve handwheel.

3. The valve handwheel and hose outlet are readily accessible.

(d) Dry and combination standpipes may be placed on either the exterior or the interior of the building; if placed in the interior, dry standpipes must be protected by not less than two-hour fire-resistive protection.

Two-inch thickness of standard 85% magnesite pipe thermal insulation, or approved insulation providing equivalent protection, may be used for the required two-hour protection.

EXCEPTION: The pipe thermal insulation is not required for portions of a dry standpipe installed within a shaft of not less than two-hour fire-resistive construction.

Standpipes subject to mechanical damage shall be adequately protected against such damage to the satisfaction of the Department.

(e) Where the installation of standpipes for temporary Fire Department use during construction is required by Article 1, Chapter 9 of the Los Angeles Municipal Code (Building Code), the riser shall be capped above the topmost outlet each time it is extended to a higher level and the required valves installed so as to be usable at all times.

B. Height of Building. 1. **Dry Standpipes.** Every building in which standpipes are required by Section 91.0511 (Building Code) and which does not exceed 150 ft. in height, may be provided with dry standpipes.

2. **Combination Standpipes.** Every building exceeding 150 ft. in height shall be provided with combination standpipes.

3. **Wet Standpipes.** Where combination standpipes are installed, the wet standpipe outlets may be supplied by the combination standpipe system providing the storage tank as required in Subdivision (c) of Subsection 2 of Section 94.30333 is connected to the combination standpipe system. The source of water supply and the method of connection to the tank shall first be approved by the Department.

SEC. 94.30333 — WET STANDPIPES

1. **Location.** In every building requiring wet standpipes, standpipe outlets shall be located on each floor and roof, and each section of the building divided by a fire separation. Every point shall be covered by a 20 ft stream of water from a nozzle attached to not more than 85 ft of hose. For measurement of the hose travel distance from a standpipe outlet, 7 ft shall be deducted from the actual hose length.

EXCEPTION: Roof outlets are not required on roofs sloping more than one vertically to six horizontally.

2. **Water Supply.**

(a) **Pressure and Gravity Tanks.** In every building eight or more stories in height, wet standpipes shall be connected to a pressure tank, A.S.M.E. constructed and stamped, or a gravity tank having a capacity sufficient to furnish at least 250 G.P.M. for a period of not less than ten minutes. Such tanks shall be located so as to provide not less than 30 pounds pressure at the topmost hose outlet for the required supply. The supply pipe shall be not less than two inches in diameter. The discharge pipes from pressure tanks shall extend two inches into and above the bottom of such tanks. Where required by the Department, tanks shall be equipped with any or all of the following for maintenance and operation: a manhole, ladder, platform, drain pipe, water and pressure gauges. Every pressure tank shall be tested in place after installation and proved tight at a hydrostatic pressure 50 percent in excess of the working pressure required. Where tanks are used for both fire and domestic purposes the domestic supply pipe shall be so located that the required standpipe demand will remain in the tank. Incombustible supports shall be provided for all tanks. Not less than a three foot clearance shall be maintained over and under all tanks. All valves or controls shall be installed in a readily accessible location.

(i) **Hose Cabinet.** Any hose cabinet that can be locked shall have an opening with a pane of single-strength glass at least 7 in. high and as wide as the construction of the door will permit. All hose cabinet doors shall be clearly labeled "FIRE HOSE" in letters at least 3 inches in height.

When a hose cabinet is to contain a fire extinguisher and the fire extinguisher is not visible with the door shut, the door shall also be clearly labeled "EXTINGUISHER" in letters at least 3 inches in height.

Hoses exposed to the weather shall be protected by a hose cabinet.

Excerpts From Los Angeles Mechanical Code

(Article 5 of Chapter 9, Los Angeles Municipal Code)

SEC. 95.3330 — LOCATION

(a) No warm air furnace shall be installed:

1. In any room or space less than 12" wider than the furnace or furnaces installed therein.

EXCEPTION: A replacement furnace occupying the same or lesser floor area may be installed in the same location as the existing furnace, provided the replacement does not violate other provisions of the Code.

2. In any hazardous location.

3. In any surgical operating room or medical treatment room.

4. Under any stairway.

5. In any Group A, B, D, E, F, J or S Occupancy unless separated from such occupancy by one-hour fire-resistive construction with all openings in such separation protected by a fire assembly or fire damper having a one-hour fire resistive rating.

EXCEPTIONS: 1. Fire dampers in openings for circulating air and conditioned air supply ducts which penetrate the required one-hour fire-resistive furnace enclosure may be omitted, provided all portions of any circulating air and conditioned air supply ducts within the furnace enclosure are covered with two inches of rock wool or fiberglass; and a manual reset temperature limit control switch which cannot be set for a temperature higher than 250°F. is installed in the largest conditioned air supply duct from each furnace. This temperature limit control switch shall be installed within three feet of the furnace, measured along the center line of the duct. Each temperature limit control switch shall shut off the source of fuel supply before the temperature in the duct exceeds 250°F.

2. This requirement shall not apply to any furnace installed on the roof of a building.

6. In any room used, or designed to be used, as a bedroom, bathroom, closet or in any confined space with access only to such room or space. The access to any furnace located in an attic or underfloor crawl space may be through a closet.

7. In a required front or side yard of a residential building as defined by Article 2, Chapter 1 of the Comprehensive Zoning Plan.

8. Outside of a building unless completely enclosed in a weatherproofed housing. This housing when constructed of metal shall be of galvanized iron or aluminum not less than No. 24 U.S. Standard Gage supported on a substantial metal frame. The housing shall not be larger than necessary to properly cover and provide a minimum six-inch clearance around the furnace or furnaces enclosed therein, including all controls and draft diverters.

EXCEPTION: Furnaces approved for outdoor installation need not be enclosed.

(b) No warm air furnace duct shall be installed in or arranged to serve any hazardous area or any surgical operating room.

(c) Every room or space in which there is located any warm air furnace arranged or approved to burn liquefied petroleum gas shall be provided with an air-tight drain not less than seven square inches (7 sq. in.) in area extending from the lowest level of such room or space to the exterior of the building and located to provide for discharge of escaping gas at a safe location at least ten feet from the building or source of ignition.

SEC. 95.5170 — EXHAUST OUTLETS

(a) Exhaust outlets for ducts that convey noxious gases, flammable vapors, corrosive vapors, and for ducts serving commercial food preparation equipment, shall terminate outside of the building and at least ten feet from any adjacent building, adjacent property line, or air intake opening into any building, and shall be located at least ten feet above the adjoining grade level. Every such exhaust outlet which is located above the roof shall extend at least two feet above the roof surface.

EXCEPTION: Exhaust outlets for ducts serving commercial food preparation equipment may terminate a minimum of five feet from any adjacent building, adjacent property line or air intake opening into a building if the air from the exhaust outlet is discharged away from such location.

(b) Exhausts, outlets for required smoke-control systems shall terminate outside of the building and at least 10 feet from any air intake opening into any building.

SEC. 95.12300 — GENERAL

(a) Supports for compressors and condensing units shall be designed to safely carry the load of the equipment supported and shall be of incombustible materials when more than 18 inches in height.

EXCEPTION: The requirements for incombustible support materials need not apply to supports for compressors and condensing units located on a wood roof if this equipment is mounted on $\frac{1}{4}$ inch asbestos millboard covered with 24 gage metal extending the full area on the underside of such equipment.

Every compressor and condensing unit when supported from the ground shall be adequately isolated from ground moisture and corrosion by adequate concrete or masonry supports designed to resist the weight of this equipment without undue settlement. Compressors and condensing units that are directly mounted upon a concrete slab shall be raised and isolated from the concrete with a suitable non-corrosive material and the concrete slab shall be raised three inches minimum above adjoining ground or paving level.

(b) An unobstructed access opening and passageway, not less than 24 inches in the least dimension, shall be provided to every compressor, unless further regulated by Section 95.12400 of this Code or by Division VI of Article 5, Chapter 9 of the Los Angeles Municipal Code (Heating, Ventilating and Air Conditioning Code).

(c) A suitable and substantial metal guard shall be provided around all flywheels, fans, pulleys and belts which are a portion of any refrigerating machinery.

(d) No portion of any refrigerating system shall be located in any elevator shaft, dumb-waiter shaft or any shaft having moving objects therein.

(e) Every room or space, other than a machinery room, complying with the requirements of Part 4 of this Division, in which any refrigerant containing portion of a condensing unit is located, shall be provided with one of the following means of ventilation:

1. Permanent gravity ventilation openings of not less than two square feet total area opening directly to the outside of the building or extending to the outside of the building by continuous ducts.

2. A mechanical exhaust system of ventilation arranged to provide a complete change of air every 20 minutes to the outside of the building.

EXCEPTION: This Subsection shall not apply to any portion of a condensing unit in a room or space if the cubical content exceeds 1000 cubic feet per horsepower of the unit or where such room or space has permanent gravity ventilation openings of two square feet minimum total area to other rooms or spaces exceeding 1000 cubic feet per horsepower.

(f) No refrigerant compressor of more than one horsepower rating shall be located less than 10 feet from any public aisle or exit passageway in any Group A, B, D, G-2, H or S occupancy unless separated by a one-hour fire-resistive partition.

(g) All refrigerant piping and fittings, brine piping and fittings, which during normal operation could reach a surface temperature below the dew point of the surrounding air and are located in spaces or areas where condensation could cause a safety hazard to the building occupants, structure, electrical equipment or any other equipment, shall be protected in a manner to prevent such damage.

(h) No compressor shall be located in any hazardous location.

(i) No portion of any refrigerating system shall be installed in any location where it would be subject to damage from an external source.

(j) No portion of any direct refrigerating system shall be located in or serve any Group D Occupancy, unless such system contains a Class 1 refrigerant; the compressor is rated at five horsepower or less; the complete system is factory assembled and tested and no refrigerant-containing parts are connected in the field.

SEC. 95.12310 — CLASS 1 REFRIGERANTS

(a) Every condensing unit or combination of refrigerant interconnected condensing units totaling 50 or more horsepower rating which contains any Class 1 refrigerant shall be enclosed in a machinery room.

EXCEPTIONS: The requirements of this Subsection shall not apply to:

1. Any condensing unit located outside of a building or on the roof of a building and not less than 20 feet from any door, window or ventilating air inlet in any building.
 2. Any condensing unit located in a building used exclusively for ice making, cold storage or for the manufacturing or processing of food or drink, provided the occupancy load does not exceed one person per 100 square feet of floor area served by such system.
 3. A Group G occupancy, if the quantity of refrigerant does not exceed 30 lbs. for each 1000 cubic feet of space in the room in which the condensing unit is located.
- (b) No portion of any direct system shall be located in any bedroom, bedcloset, clothes closet, bathroom or rest room unless the refrigerating system serving such evaporator contains only Class 1 refrigerant in an amount not exceeding 30 lbs. for each 1000 cubic feet of space in the smallest room served by the system.

SEC. 95.12320 — CLASS 2 REFRIGERANTS

(a) No unit refrigerating system and no refrigerant containing portion of a refrigerating system containing a Class 2 refrigerant shall be located in any building unless all refrigerant containing portions of the system are enclosed in a machinery room. Such system when installed outside of a building shall be located at least 20 feet from any exit passageway, door, window or ventilating air inlet in any building.

EXCEPTION: This Subsection shall not apply to a building used exclusively for ice making, cold storage, or for the manufacturing or processing of food or drink, provided the occupancy load does not exceed one person per 100 square feet of floor area served by such system.

(b) No portion of any refrigerating system containing Class 2 refrigerant shall be located in any exit passageway.

PART 4—MACHINERY ROOMS

SEC. 95.12400 — MACHINERY ROOMS

(a) Every machinery room required by this Code shall be of at least one-hour fire-resistive construction with all openings protected as provided in Subsection (b) of this Section.

Pipes may pass through fire-resistive walls, floors and ceilings if the required fire resistance is not unduly impaired. Voids around pipes shall be sealed with fire-resistive materials.

(b) Every opening between a machinery room and any other portion of the building shall be protected with a fire assembly or fire damper complying with the requirements of the Los Angeles Building Code for at least a one-hour fire-resistive rating.

Every exterior wall opening of a machinery room shall be protected with a fire assembly or a fire damper having a fire-resistive rating of not less than 45 minutes.

EXCEPTION: Protection of exterior wall openings may be omitted provided all of the following conditions are met:

1. The opening is 10 feet or more from a property line;
2. The opening is 20 feet or more from an unprotected opening in another building;
3. The opening is 20 feet or more from a building which has less than one-hour fire-resistive exterior walls;
4. The opening is 20 feet or more from the opposite side of a public way.

Ventilation opening in the ceiling of a machinery room need not be protected, provided they open directly to the outside of the building.

(c) There shall be no direct opening between a machinery room and a boiler room.

There shall be no direct opening between any machinery room containing any Class 2 refrigerant and any room or space in which there is an open flame, spark-producing device or heating surface in excess of 800°F.

(d) Every machinery room containing any Class 2 refrigerant shall have at least two means of exit located at least one-fifth the perimeter of the room apart. Exit openings shall be not less than 3'0" x 6'8".

Every machinery room containing any Class 1 refrigerant shall have at least one means of exit. Such exit opening shall be not less than 3'0" x 6'8".

(e) Every machinery room door shall open in the direction of exit into an egress as specified in Division 33, Article 1, Chapter 9 of the Los Angeles Municipal Code (Los Angeles Building Code).

All doors shall be operable from the inside of the machinery room without the use of a key or any special knowledge.

(f) Every machinery room shall have an area of not less than 50 square feet.

(g) An unobstructed working space not less than two feet, six inches in width and not less than seven feet in height shall be provided around not less than two adjacent sides of all moving machinery in any machinery room.

SEC. 95.12410 — MACHINERY ROOM VENTILATION

Every machinery room shall be provided with means of ventilation to the outer air. Such ventilation shall be either:

1. A separate and individual exhaust system of ventilation serving no other area, arranged to provide a complete change of air in such room at least once every five minutes and discharge to the outer air at a location not less than 20 feet from any exterior door, window or ventilation air inlet in any building.

Each exhaust ventilation system shall be controlled by a readily accessible emergency ventilation switch located within two feet of the switch specified in Section 95.12420(c) and the switch shall be labeled to comply with Part 7 of this Division.

2. Gravity ventilation openings to the outside of the building having a cross-sectional area of $1/20$ of the floor area of the machinery room, but in no case need the area of the openings be more than 1000 sq. inches. Such openings shall be so installed that approximately $1/2$ of the required area is located within 12 inches of the ceiling and $1/2$ of the required area is located within 12 inches of the floor of the room. Every portion of the lower opening shall be horizontal or slope downward from the opening in the machinery room to the exterior of the building at or above the adjacent ground level.

SEC. 95.12420 — EQUIPMENT IN A MACHINERY ROOM

(a) No direct-fired appliance shall be located in any machinery room.

(b) Unless otherwise approved by the Department, no electrical equipment, or electrical control or control panel, other than listed below, shall be located in any machinery room.

1. Lights and receptacles.

2. Machinery room exhaust fans and blowers.

3. Any refrigerating condensing unit or portion thereof.

4. Circulating pumps for condensers, cooling towers or cooling coils.

5. Air compressors serving only automatic controls within the refrigerating or comfort cooling system.

6. Electrically operated valves for the control of a refrigerant or for the control of the circulation of a cooling fluid.

7. Blowers and fans for cooling towers or for condensers.

8. Absorption units using steam or hot water as the source of heat for operation.

9. Any electric control or control panel for any of the above items.

(c) A readily accessible single emergency refrigeration control switch shall be provided to shut off all electrically operated machinery in any machinery room, except the exhaust ventilation system complying with Section 95.12410. Such switch shall be controlled from a point outside of, and within 10 feet of the required opening to the machinery room it serves, and the switch shall be labeled to comply with Part 7, Division 3, of this Code.

NOTE: For other requirements concerning the location of this switch, see Division 380, Article 3, Chapter 9 of the Los Angeles Municipal Code (Los Angeles Electrical Code).

Repair, Vacation and Demolition of Dangerous Buildings

(Division B of Article 6 of Chapter 9, Los Angeles Municipal Code)

SEC. 98.100 — DECLARATION OF PURPOSE

It is the purpose of the provisions of this Division to provide a just, equitable, and practicable method, to be cumulative with and in addition to any other remedy available at law, whereby buildings or structures which are dilapidated, unsafe, dangerous, insanitary, or are a menace to the life, limb, health, morals, property, safety and general welfare of the people of this City, or which tend to constitute a fire hazard, may be required to be repaired, vacated, or demolished.

SEC. 98.101 — DANGEROUS AND SUBSTANDARD RESIDENTIAL BUILDINGS DEFINED

(a) Dangerous Building: For the purpose of this Division, any building or structure which has any or all of the defects hereinafter described shall be deemed a dangerous building. 1. Whenever any door, aisle, passageway, stairway or other means of exit is not of sufficient width or size, or is not so arranged as to provide safe and adequate means of exit, in case of fire or panic, for all persons housed or assembled therein who would be required to, or might, use such door, aisle, passageway, stairway or other means of exit;

2. Whenever the stress in any materials, member or portion thereof, due to all dead and live loads, is more than one and one-half times the working stress or stresses allowed in Article 1 of Chapter 9 of this Code;

3. Whenever any portion thereof has been damaged by earthquake, wind, flood, or by any other cause, in such a manner that the structural strength or stability thereof is appreciably less than it was before such catastrophe and is less than the minimum requirements of this Code for a new building of similar structure, purpose or location;

4. Whenever any portion or member or appurtenance thereof is likely to fail, or to become detached or dislodged, or to collapse and thereby injure persons or damage property;

5. Whenever any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof is not of sufficient strength or stability, or is not so anchored, attached or fastened in place so as to be capable of resisting a wind pressure of one-half that specified by Article 1, Chapter 9, of the Los Angeles Municipal Code, without exceeding the working stresses permitted in Article 1 of this Chapter;

6. Whenever any portion thereof has settled to such an extent that walls or other structural portions have materially less resistance to winds or earthquakes than is required in the case of new construction;

7. Whenever the building or structure, or any portion thereof, because of dilapidation, deterioration, decay, faulty construction, or because of the removal or movement of some portion of the ground necessary for the purpose of support-

ing such building or portion thereof, or some other cause, is likely to partially or completely collapse, or some portion of the foundation or underpinning is likely to fail or give way;

8. Whenever for any reason whatsoever, the building or structure, or any portion thereof, is manifestly unsafe for the purpose for which it is used;

9. Whenever the exterior walls or other vertical structural members list, lean or buckle to such an extent that a plumb line passing through the center of gravity does not fall inside the middle third of the base;

10. Whenever the building or structure, exclusive of the foundation, shows 33% or more of damage or deterioration to the member or members, or 50% of damage or deterioration of a nonsupporting enclosing or outside wall or covering;

11. Whenever the building or structure has been so damaged by fire, wind, earthquake or flood, or has become so dilapidated or deteriorated as to become an attractive nuisance to children who might play therein to their danger, or as to afford a harbor for vagrants, criminals, or immoral persons, or as to enable persons to resort thereto for the purpose of committing nuisance or unlawful or immoral acts;

12. Any building or structure which has been constructed, or which now exists or is maintained in violation of any specific requirement or prohibition, applicable to such building or structure, of the building regulations of this City, as set forth in Article 1 of this Chapter, or of any provisions of Article 7 of Chapter 5 of the Los Angeles Municipal Code relating to the prevention of fire, when so determined and reported by the Chief Engineer, Fire Department, or of Article 1 of Chapter 3 of said Code relating to the protection of health when so determined and reported by the Health Officer, or of any law or ordinance of this State or City relating to the condition, location or structure of buildings;

13. Any building or structure which, whether or not erected in accordance with all applicable laws and ordinances, has in any non-supporting part, member or portion, less than 50%, or in any supporting member less than 66% of the strength, fire-resisting qualities or characteristics or weather-resisting qualities or characteristics required by law or ordinance in the case of a newly-constructed building of like area, height and occupancy in the same location;

14. Whenever a building or structure, used or intended to be used for dwelling purposes, because of dilapidation, decay, damage, or faulty construction or arrangement, or otherwise, is insanitary or unfit for human habitation or is in a condition that is likely to cause sickness or disease, when so determined by the Health Officer, or is likely to work injury to the health, safety, or general welfare of those living within;

15. Whenever the building or structure, used or intended to be used for dwelling purposes, has light, air and sanitation facilities inadequate to protect the health, safety, or general welfare of persons living within;

16. Whenever any building or structure by reason of obsolescence, dilapidated condition, deterioration, damage, electric wiring, gas connections, heating apparatus or other cause, is in such condition as to be a fire hazard and is so situated as to endanger life or other buildings or property in the vicinity or provide a ready fuel supply to augment the spread and intensity of fire arising from any cause.

(b) Substandard Residential Building. For the purpose of this Division, any residential building or structure defined as such by Section 91.4902 (s) of this Chapter.

SEC. 98.101.1 — OTHER DEFINITIONS

For the purposes of this Article: (a) Board, unless otherwise specified, shall mean the Board of Building and Safety Commissioners.

(b) Department, unless otherwise specified, shall mean the Department of Building and Safety.

(c) "Superintendent" shall include the Superintendent of Building or his duly authorized representative.

SEC. 98.101.2 — DANGEROUS AND SUBSTANDARD RESIDENTIAL BUILDING—NUISANCES

All dangerous buildings and substandard residential buildings within the terms of Section 98.100 of this Article are hereby declared to be public nuisances and shall be vacated, repaired, or demolished as hereinafter provided.

SEC. 98.102 — INSPECTION — WHEN REQUIRED

The Department of Building and Safety shall cause any building or structure to be inspected for the purpose of determining whether or not it is a dangerous building or substandard residential building within the meaning of this division, in any of the following events: (a) Whenever that Department, in its reasonable discretion, shall determine that such inspection is necessary;

(b) Whenever the Housing Authority of the City of Los Angeles, acting pursuant to the provisions of Section 8 of the Housing Authorities Law of this State, shall transmit to the Department its written recommendations and findings that such building or structure is in such condition as to be dangerous to the public health, morals, safety or welfare;

(c) Whenever any person files with the Department a verified complaint wherefrom there is, in the opinion of the Department, probable cause to believe that the building or structure is a dangerous building or substandard residential building.

(d) Whenever any member of the Fire Department or Police Department of this City, or member of the County Health Department, transmits to the Department a written report, from the facts of which there is, in the opinion of the Department, probable cause to believe that the building or structure is a dangerous building or sub-standard residential building.

SEC. 98.104 — REPORT OF INSPECTION

Upon the completion of the inspection, a written report shall be filed, setting forth the facts as to the condition of the building or structure and the work needed to be done thereon.

SEC. 96.105 — SUPERINTENDENT OF BUILDING TO ACT ON REPORT

If the Superintendent of Building shall determine from the report that there is probable cause to believe that the building or structure is a dangerous building or substandard residential building, he may request that the matter be set for hearing by the Board and a notice of such hearing shall be given as hereinafter provided.

SEC. 96.106 — NOTICE OF HEARING — FORM AND CONTENTS

Notice of the hearing shall be given upon a form prescribed by the Superintendent of Building. It shall set forth the street address and a legal description, sufficient for identification, of the premises upon which the building or structure is located. It shall contain a brief statement of the conditions which show probable cause to believe that the building or structure is a nuisance within the terms of Section 96.101 of this Article. It shall state the date, hour and place of the hearing and shall order all interested parties who desire to be heard in the matter to appear to show cause why the building or structure should not be ordered repaired, vacated and repaired, or demolished.

SEC. 96.107 — NOTICE OF HEARING TO BE POSTED

One copy of the notice shall be posted in a conspicuous place upon the building or structure involved.

SEC. 96.108 — NOTICE OF HEARING — PERSONS ENTITLED TO NOTICE

One copy of the notice shall be served upon the following: The person, if any, in real or apparent charge and control of the premises involved; the record owner; the holder of any mortgage, trust deed, or other lien or encumbrance of record; the owner or holder of any lease of record; the record holder of any other estate or interest in or to the building or structure or the land upon which it is located.

SEC. 96.109 — NOTICE OF HEARING — SERVICE

(a) **Method of Service.** The notice of hearing shall be served upon all persons entitled thereto either personally or by certified or registered mail. Service by certified or registered mail shall be effective on the date of mailing if a certified or registered letter containing a copy of such notice is mailed, postage prepaid, return receipt requested, to each such person at the address of such person as it appears on the last equalized assessment roll of the county or as known to the City Clerk. If no such address so appears or is known to the City Clerk, then a copy shall be addressed to such person at the address of the building or structure involved in the proceedings. The failure of any owner or other person to receive such notice shall not affect in any manner the validity of any proceedings taken hereunder.

(b) **Affidavit of Service.** The officer or employee of the Department, upon giving notice as provided herein, shall file an affidavit thereof certifying to the time and manner in which such notice was given. He shall also file therewith any receipt card which may have been returned to him in acknowledgement of the receipt of such notice by certified or registered mail.

SEC. 96.110 — TIME OF POSTING AND SERVICE OF NOTICE OF HEARING

The notice of hearing shall be posted and served at least 10 days prior to the date set for the hearing.

SEC. 96.111 — HEARING

The Board or a duly appointed hearing examiner shall:

(a) Hold a hearing as requested by the Superintendent, and hear and consider any evidence offered by the owner, occupant or person in charge and control, mortgagee or beneficiary under any deed of trust, lessee, or any other person having any estate or interest in said building or structure, pertaining to the matter set forth in the report;

(b) Make written findings of fact as to whether or not the building or structure in question is a dangerous building or substandard residential building within the terms of this division.

SEC. 96.112 — STANDARDS FOR REPAIR, VACATION AND REPAIR, OR DEMOLITION

The following standards shall be followed in substance in ordering the repair, vacation or demolition of any building or structure. Any order to demolish, rendered pursuant to this Section, shall not indicate an alternative permission to repair; however, an order to repair may be satisfied by demolition.

(a) If the dangerous building or substandard residential building can be reasonably repaired so that it will no longer exist in violation of the Los Angeles Municipal Code, it shall be ordered repaired.

(b) If the dangerous building or substandard residential building is in such condition as to make it dangerous to health, morals, safety, or general welfare of its occupants, it shall be ordered to be vacated.

(c) In any case where a dangerous building is 50 per cent damaged, or decayed, or deteriorated, it shall be demolished.

(d) In all cases where a dangerous building or substandard residential building cannot be reasonably repaired so that it will no longer exist in violation of the terms of the Los Angeles Municipal Code, it shall be vacated and demolished.

(e) In all cases where a dangerous building or substandard residential building is a fire hazard, existing or erected in violation of the terms of this division or any ordinance of this City, or statute of the State of California, it shall be demolished.

SEC. 96.113 — REQUESTS FOR REPORTS OF OTHER DEPARTMENTS

(a) Whenever, in the course of any proceedings taken hereunder, the Board or Superintendent shall have cause to require additional evidence as to whether or not any building or structure is a fire or life hazard, or is detrimental to the health of the persons living therein, in comparison with buildings or structures constructed in accordance with the minimum requirements of Article 1 of Chapter 9 of the Los Angeles Municipal Code, the Board or Superintendent may request that the same be inspected by the Fire Department or by the County Health Department, as the case may be, or by both of such departments.

(b) The Department to which such request is directed shall cause the building or structure to be inspected with particular reference to the characteristics inquired about, and a report thereof in writing shall be transmitted to the requesting authority within five days of the receipt of the request for such report. The report shall be considered along with other evidence at the hearing.

SEC. 96.114 — FINDINGS OF HEARING

Within 60 days after the conclusion of the hearing, the Board shall submit its findings and recommendations to the Superintendent.

SEC. 96.115 — ORDER TO REPAIR, VACATE AND REPAIR OR DEMOLISH

If, from the Findings and Recommendations of the Board and the Report of Inspection, the Superintendent of Building shall determine that the building or structure involved is a dangerous building or substandard residential building within the terms of this Division, then he shall issue an order:

- (a) That the building must be repaired, vacated and repaired, or demolished;
- (b) That the occupant, lessee, or other person in possession must vacate said building, or that he may remain in possession while repairs are being made;
- (c) That any mortgagee, beneficiary under a deed of trust, or any other person having an interest or estate in said building may, at his own risk, repair, vacate and repair, or demolish said building.

SEC. 96.116 — ORDER TO REPAIR, VACATE AND REPAIR OR DEMOLISH — CONTENTS

(a) The order shall set forth the street address of the building or structure and a legal description of the premises sufficient for identification. It shall contain a statement of the particulars which render the building or structure a dangerous building or substandard residential building and a statement of the things required to be done.

(b) The Order shall specify the time within which the work required must be commenced, which shall be not less than 10 days nor later than 30 days after the issuance of the Order, and shall further specify a reasonable time within which the work shall be completed.

(c) However, upon written application by an interested party, for good cause shown and where no imminent risk to life or property is present, the Superintendent, or the Board, in case an appeal is made to it under Section 96.0403, may grant a reasonable extension of time not to exceed 120 days within which the work required must be commenced. Provided, however, that any appeal to the Board for an extension of time to repair a vacant privately-owned building shall be decided by the Board no later than 30 days after the hearing thereon and may only be granted upon the condition that such repairs be completed within a maximum period of 180 days and upon the further condition that no additional time will be granted.

SEC. 96.117 — ORDER TO REPAIR, VACATE AND REPAIR, OR DEMOLISH, TO BE POSTED AND SERVED

A copy of the order to repair, vacate and repair, or demolish any structure shall be posted in a conspicuous place upon the building, and shall be served in the manner above-prescribed in the case of the notice of hearing, upon all persons to whom the notice of hearing is required to be served.

SEC. 96.117.1 — APPEAL FROM ORDER

Within ten (10) days from the service of the order as provided in Section 96.117, the owner or other person having charge and control over any building or structure affected by such order may appeal to the Board of Building and Safety Commissioners in accordance with such procedure as may be established by such Board.

Upon such appeal the Board may affirm, modify or annul the order appealed from, including any of the terms or conditions thereof.

No order to repair, vacate and repair, or demolish any structure shall be enforced if annulled by the Board on appeal or enforced contrary to any modification of such order made by the Board on appeal.

SEC. 96.118 — VIOLATIONS — PENALTIES FOR DISREGARDING ORDER

(a) The owner or other person having charge and control over any building or structure determined by the Department or by the Board, upon appeal, to be a dangerous building or substandard residential building who shall fail to comply with any order to repair, vacate and repair, or demolish said building shall be guilty of a misdemeanor.

(b) The occupant or lessee in possession who fails to comply with any order to vacate said building in accordance with any order given as provided for in this Division shall be guilty of a misdemeanor.

(c) Any person who removes any notice or order posted as required in this division shall be guilty of a misdemeanor.

SEC. 96.119 — FAILURE TO COMPLY WITH ORDER—DEPARTMENT MAY SELL, REPAIR, OR DEMOLISH BUILDING

Whenever an order to repair, vacate and repair, or demolish any building or structure has not been complied with within the time set by the Department, or within such additional time as the Department or the Board, upon appeal, may for good cause extend, the Department shall have the power, in addition to any other remedy provided, to:

(a) Cause the material of any such building or structure to be sold in any manner which the Department may determine upon; provided, however, that any such sale shall be upon condition that the building or structure be forthwith demolished, the wreckage and debris thereof removed and the lot cleaned; the Department may sell any such building singly or otherwise, as the Department may find desirable in order to insure that the consideration obtained from one or any number of such buildings shall be adequate to pay the cost of demolition and of cleaning the sites. Any surplus from the sale of any such building or structure, or group of buildings or structures, over and above the cost of demolition and of cleaning the sites, shall be retained to be distributed to the parties or persons lawfully entitled thereto.

(b) Cause the building or structure to be repaired or demolished by such means as the Department may deem advisable. The cost thereof shall be paid from the "Repair and Demolition Fund" and assessed against the property upon which the particular building or structure is located.

(c) Any work to be accomplished pursuant to this section shall be performed in accordance with established practices of public works.

(d) When the Department determines to cause the repair or removal of the building or structure, it shall notify the owner or other person in charge or control thereof of its intention so to do, and shall specify a date certain upon which it shall solicit bids or execute a demolition work order to accomplish the necessary work not sooner than ten days from the date such notice is given. One or more annual unit price demolition contracts as defined in Section 91.4934 of this code may be awarded for the demolition of privately-owned readily accessible one- and two-story wood frame structures located on level lots. No demolition work order shall be executed except in conjunction with the necessary contract or contracts.

SEC. 96.119.1 — FAILURE TO COMPLY WITH ORDER — OWNER LOSES RIGHT TO REPAIR OR DEMOLISH AFTER DEPARTMENT HAS SOLICITED BIDS OR EXECUTED A DEMOLITION WORK ORDER — THEREFOR

(a) Whenever the Department has undertaken action to sell, repair or demolish any building, or structure under the provisions of this article upon failure of the owner or other interested party to comply with an order therefor, and has caused the solicitation of bids, or executed a demolition work order to accomplish said work, the owner or other persons having charge or control over said building or structure shall be deemed to have forfeited all further rights and privileges to do such work and is thereafter prohibited from doing any such work on said building or structure, except as the Department may otherwise allow.

(b) In the event that the owner or other person having charge or control of the building or structure proceeds to perform the work of repairing or demolishing a building or structure without a permit and in violation of Subsection (a) hereof, the Department shall charge the person who caused said work to be performed the sum of \$50 as partial reimbursement to the City for those expenses incurred in the preparation of the bid and administering the invitation to bid or preparation and execution of the demolition order.

SEC. 96.120 — CITY COUNCIL TO ESTABLISH REPAIR AND DEMOLITION FUND

(a) The City Council shall set up a special revolving fund to be designated as the "Repair and Demolition Fund." Payments shall be made out of said fund upon the demand of the Superintendent of Building to defray the costs and expenses which may be incurred by said Department in causing the necessary work of repair or demolition to dangerous buildings and substandard residential buildings.

(b) The Council may be at any time transfer to such special fund, out of any money in the General Fund of said City, such sums as it may deem necessary in order to expedite the performance of the work of demolition or repair, and the sum so transferred shall be deemed a loan to said special fund and shall be repaid out of the proceeds of the assessment provided for in the following Section. All funds collected under the proceedings hereinafter provided for, either upon voluntary payments or as the result of the sale of property after delinquency, shall be paid when collected to the City Treasurer, who shall place the same in the Repair and Demolition Fund.

(c) At the close of each fiscal year, all monies in said Repair and Demolition Fund in excess of \$250,000.00, over and above the amount of outstanding liabilities payable out of such fund, shall be transferred to the Reserve Fund.

SEC. 96.120.1 — COSTS TO BE ASSESSED AGAINST PROPERTY WHEN

Whenever the owners, lessees, incumbancers and others having any estate or interest in any dangerous building have failed within the time fixed to repair or demolish the same as ordered, and whenever the Department has not sold the building or structure for purposes of demolition as permitted elsewhere in this division, the Department may proceed to have the cost of such repair or demolition assessed against the property upon which the particular building or structure is located and recover from the sale of such property as hereinafter provided.

Such costs shall include, in addition to the cost to complete the work or demolish the building, an amount equal to thirty per cent of such cost, but not less than the sum of \$100, to cover the cost of the City administering the contract and supervising the work required.

SEC. 96.121 — ASSESSMENT OF COST OF REPAIR OR DEMOLITION

(a) **Filing of Report—Contents.** The Department shall keep an itemized account of the net expense involved in the repairing or demolishing of such buildings. Upon the completion of the repair or demolition, the Department shall prepare and file with the City Clerk, in duplicate, a report specifying the work done, the net cost of the work, a description of the real property upon which the building or structure was located, the names and addresses of the persons entitled to notice pursuant to Section 96.108, and the assessment against each lot or parcel of land proposed to be levied to pay the cost thereof. Any such report may include repair or demolition work on any number of buildings or structures on any number of parcels of property, whether contiguous to each other or not.

(b) **Report Transmitted To Council — Set for Hearing.** Upon receipt of the report, the City Clerk shall present it to the City Council for consideration. The City Clerk shall cause notice of the cost of the repair or demolition to be posted upon the property, published once in a newspaper of general circulation in the City, and served by registered or certified mail, postage prepaid, addressed to the owner of the property as his name and address appears on the last equalized assessment roll of Los Angeles

County, if such so appears, or as known to the Clerk. Such notice shall be given at least ten days prior to the date set for hearing and shall specify the day, hour, and place when the Council will hear and pass upon the said report of the Department, together with any objections or protest which may be filed as hereinafter provided by any person interested in and affected by the proposed assessment.

(c) **Protest and Objections—How Made.** Any person interested and affected by the proposed assessment may file written protests or objections with the City Clerk at any time prior to the time set for the hearing on the report of the Department. Each such protest or objection must contain a description of the property in which the signer thereof is interested and the grounds of such protest or objection. The City Clerk shall endorse on every such protest or objection the date it was received by him. He shall present such protests or objections to the City Council at the time set for the hearing, and no other protests or objections shall be considered.

(d) **Hearing of Protests.** Upon the day and hour fixed for the hearing the Council shall hear and pass upon the report of the Department, together with any objections or protests. The Council may make such revision, correction or modifications in the report on the assessment as it may deem just, and when the Council is satisfied with the correctness of the assessment, the report as submitted or as revised, corrected or modified, together with the assessment shall be confirmed. The decision of the Council on the report and the assessment and all protests or objections shall be final and conclusive. The Council may adjourn the hearings from time to time.

(e) **Contest.** The validity of any assessment made under the provisions of this Section shall not be contested in any action or proceeding unless the same is commenced within 30 days after the assessment is recorded as provided herein. Any appeal from a final judgment in such action or proceeding must be perfected within 30 days after the entry of such judgment.

(f) **Authority for Installment Payment of Assessments With Interest.** The Council, in its discretion, may determine that assessments in amounts of \$50 or more shall be payable in not to exceed five equal annual installments; and may also determine that after 30 days after recording of the assessment by the Board of Public Works all sums then unpaid shall bear interest. Such interest shall be at a rate not to exceed six percent per annum, and shall accrue in monthly amounts on the first day of each month after 30 days after recording of the notice of lien hereinafter provided for. The Council's determination to allow payment of such assessments in installments, the number of installments, whether they shall bear interest, and the rate thereof shall be by a resolution adopted prior to the confirmation of the assessment.

(g) **Recordation of Assessment.** Upon the confirmation of the assessment, the City Clerk shall transmit it and the report to the Board of Public Works. ➤ The said Board shall file the same in a suitable book to be kept for that purpose in the assessment section of the Bureau of Engineering. The Board shall further prepare and record with the County Recorder of Los Angeles County a certificate legally describing the real property which has been assessed, stating the date of the assessment, and notifying that from and after said date the real property described is subject to a lien in the amount of the assessment for the cost of abating a nuisance upon the described real property. <

(h) **Lien of Assessment—Priority.** Immediately upon its recording in the assessment roll of the Bureau of Assessments, the assessment shall be deemed to be complete, the several amounts assessed shall be payable, and the assessments shall be liens against the lots or parcels of land assessed, respectively. The lien shall be subordinate to all existing special assessment liens previously imposed upon the same property, and shall be paramount to all other liens except for state, county and municipal taxes with which it shall be upon a parity. The lien shall continue until the assessment and all interest and costs due and payable thereon are paid, or until the property is sold and deeded to the purchaser or assignee as provided herein.

(i) **Notice of Recordation of Assessment.** The Board of Public Works shall cause a notice to be published at least once in a newspaper of general circulation in the City of Los Angeles and shall cause notices to be mailed by registered or certified mail, postage prepaid, addressed to the owners of assessed properties, or their agents, at their names and addresses are known by the Director of the Bureau of Assessments containing descriptions of the respective lots or parcels of land of such owners. Such Notices shall state briefly that the assessments have been recorded, the amounts thereof, that the same are payable, and such other matters regarding interest, delinquency, and sale as are applicable to such lots or parcels. The failure to mail any such notice or the failure of any person to receive the same shall not affect the validity of any proceedings taken under this section.

(j) **Cash Assessments—Payment—Delinquency.** Cash assessments shall be due and payable upon the confirmation thereof; and shall become delinquent if not paid in full, and the assessed property will be subject to sale as hereinafter provided, within a period of 30 days after the date of recordation of the assessment in the assessment roll of the Bureau of Assessments.

(k) **Installment Assessments—Payments—Maturity Date.** Installment assessments shall be due and payable, together with any accrued interest and costs, at any time after the confirmation thereof and before the assessed property is sold for delinquency; and may be paid in full without interest on or before the 30th day after recordation of the assessment in the said assessment roll. Thereafter the unpaid balance of the principal amount of the assessment shall be divided into equal annual installments. To each current installment interest shall be added as it accrues monthly on the total balance of such principal amount then unpaid; except that interest which accrues on the first day of December preceding the delinquency date for any installment, the balance of which installment is duly paid before delinquency, shall be added instead to the next annual

Installment. The number of installments and the rate of interest shall correspond with the determination thereof by the Council, and unless each of such installments, including such accrued interest, is paid before the respective date for the delinquency thereof, such installment shall become delinquent and the assessed property will be subject to sale as hereinafter provided. The date for delinquency of the final installment shall also be designated as the maturity date of the assessment.

(l) **Same—Delinquency Dates.** The first installment including accrued interest, or any part thereof shall become delinquent if the same is not paid on or before the thirty-first day of December after the October 15th following the expiration of said 30 day period.

Succeeding installments in order shall likewise become delinquent if any amounts thereof, including interest, are not paid on or before the thirty-first day of each December thereafter until and including the maturity date of the assessment.

(m) **Same—Declaration of Default Prior to Maturity Date.** At any time after an installment becomes delinquent and while the delinquent amount is still unpaid, the Council may declare the whole unpaid amount on account of the assessment to be in default and delinquent; and after such declaration the lot or parcel of land against which the assessment was levied shall be advertised and sold in the manner hereinafter provided, as though the whole amount or final installment of such assessment had become delinquent for failure to pay prior to the dates therefor.

(n) **Mailing Annual Installment Bills.** On or about the first day of November preceding the delinquency date for any installment, the Board of Public Works shall cause written bills or invoices specifying the amounts and dates for payment and delinquency to be mailed to the owners of assessed properties, or their agents, as known by the Director of the Bureau of Assessments. The failure to mail any bill or invoice or the failure of any person to receive the same shall not affect the validity of any assessment, lien, penalty, sale or other proceeding provided for in this section.

(o) **Payments by Mail.** If a remittance to cover a payment required herein to be made prior to a certain time, to avoid interest or sale for delinquency, is correctly addressed and sent through the United States mail it shall be treated for such purposes as if it had been received on the date and time shown by the post office cancellation mark stamped upon the envelope containing the remittance. Any such payment received more than 30 days after the date of the accrual of interest or of the making of sale shall not relieve the property from such interest or sale but may be applied toward the amount required to pay off the assessment or to redeem the property from the sale. No payment on an assessment or for redemption shall be accepted after the execution and delivery of a deed of the sold property.

(p) **Delinquent List—Notice of Sale.** Within 90 days after any cash assessment becomes delinquent, or if any assessment is payable in installments, within 90 days after the last installment thereof becomes delinquent, or if the Council declares any installment assessment to be in default and delinquent, within 90 days after such declaration, the Board of Public Works shall publish in a daily newspaper of general circulation in the City a Notice of Sale of properties on which the assessments have not been fully paid.

The notice so published shall constitute the delinquent list, and shall contain a full description of each such lot or parcel of land to which the notice shall refer; the name of the owner as known by the Director of the Bureau of Assessments, otherwise designating him as unknown; the total amount of the assessment, interest, and costs due, including the cost of advertising, for each lot or parcel of land separately assessed; the place, day and hour of sale, which day shall not be less than 20 days from the date of publication of the notice; and a statement that unless the assessments, interest, and costs on any such lot or parcel of land are paid to the Bureau of Assessments prior to the time of sale such lot or parcel will be sold to the City for the said total amount due plus \$7.00 for a certificate of sale.

(q) **Combining of Notices of Sales.** Whenever assessments or installments for two or more repair or demolition proceedings hereunder are delinquent and the properties assessed are to be sold therefor on the same date, a separate notice may be published for each assessment; or the required notices of the delinquency and sale of any or all of such properties may be combined where practicable.

(r) **Payment of Assessment Before Sale.** At any time after such delinquency and prior to the sale any person may pay the assessment, together with the interest and costs due thereon, including the cost of advertising, if such payment is made after the publication of the notice of sale.

(s) **Sale of Delinquent Property—Funds.** At the time fixed in the notice of sale the lots or parcels of land on which the total amount of the delinquent assessments together with penalties and costs have not been fully paid shall by operation of law be sold by the Board of Public Works to the City of Los Angeles for such total amount due plus \$7.00 for each such lot or parcel of land for a certificate of sale; and the fact of such sale shall be entered on the assessment roll of the Bureau of Assessments opposite the description of each property sold.

Funds in the amount for which such properties are sold to the City shall be transferred to the Repair and Demolition Fund, and thereafter any redemption payments received on account of sold properties shall be applied to reimburse the fund from which the transfer was made.

(t) **Certificate of Sale.** The Board of Public Works shall issue original and duplicate certificates of sale, referring to the proceedings, describing each lot or parcel of land sold, stating that the properties are sold to the City and giving the amount for which each is sold. The original certificate shall be filed with the City Clerk and the duplicate shall be retained as a record of the sale in the Bureau of Assessments. Any such certificate may include any number of parcels of property whether contiguous to each other or not.

(u) **Redemption of Sold Property.** At any time prior to the issuance and delivery of a deed to any property sold under the provisions of this section, such sold lot or parcel of land may be redeemed by the payment to the Board of Public Works of the amount for which the same was sold, with an additional penalty of one percent per month, until paid,

of said amount of sale, together with such other amounts as may be payable as provided for in this section. Said one percent penalties shall be added on the first day of each month following the date of sale of said property. Upon the redemption from sale of any lot or parcel of land the fact and date of such redemption shall be reported to the City Clerk and shall be entered on the original and duplicate certificates of sale. ➤ A recordable document reciting the fact of redemption and the release of the City's interest shall be provided upon request for recordation by the person requesting same. <

(v) **Deed to Unredeemed Property.** At any time after the expiration of one year and within four years from the date of sale, and after the giving of notice and filing of affidavits as hereinafter provided, the Board of Public Works shall execute to the City as purchaser and deliver to the City Clerk a deed of the property sold and not redeemed, in which shall be recited substantially the matters contained in the certificate of sale relating to such lot or parcel of land and the fact that no person has redeemed the same.

(w) **Notice of Application for Deed.** At least 30 days before it executes the deed the Board of Public Works shall serve a written notice upon the owner of the property purchased, or cause such notice to be served by registered mail, postage prepaid, addressed to the owner as his name and address appear on the last equalized assessment roll of Los Angeles County, if they so appear, or as known to the City Clerk, and shall serve such notice upon the party occupying the property, if the property is occupied by someone other than the owner. If the occupant of the property cannot be found after due diligence, or if the property is unoccupied, a similar notice shall be posted in a conspicuous place upon said property at least 30 days before the date stated therein on which the deed will be executed. The notice shall set forth a description of the property, stating that said property has been sold for a delinquent assessment, specifying the purpose for which the same was levied, the amount for which the delinquent property was sold, the amount necessary to redeem at the time of giving notice and the time when the Board will execute a deed to the City.

(x) **Affidavit of Notice.** Affidavits must be filed in the office of the Bureau of Assessments showing that such written notices, as required herein, were served upon or caused to be mailed to the owner of the property, and served upon the occupant or posted, and showing due diligence if the property is occupied and the occupant cannot be found. If redemption of the property is made after affidavits are filed, the person making such redemption must pay, in addition to the other amounts required \$3.00 for the service of notice and the making of such affidavits. The Board of Public Works shall not deliver a deed until the written notice has been served, caused to be mailed or posted and affidavits have been filed as required herein.

(y) **Evidentiary Effect of Deed.** The deed of the Board of Public Works shall be prima facie evidence of the truth of all matters recited therein and of the regularity of all proceedings prior to the execution thereof, and of title in the grantee.

SEC. 96.121.1 — DEMOLITION OR REPAIR BY DEPARTMENT OF BUILDING AND SAFETY

Whenever, as to any particular "dangerous building" there are adequate funds available in the Repair and Demolition Fund, the Department may proceed to cause the building or structure to be repaired or demolished, by such means as the Department may deem advisable, and the cost thereof shall be paid from that fund.

SEC. 96.121.2 — PROCEEDINGS UNDER STATE HEALTH AND SAFETY CODE

Any money transferred to the Repair and Demolition Fund by the City Council may be used by the Department to defray the necessary costs and expenses entailed in the demolition or repair of any dangerous building, as defined in Section 15035 of the Health and Safety Code of California, in any proceedings undertaken pursuant to Sections 17821 to 17829, inclusive, of that Code. In any such case, the amount so expended shall be restored to the fund from any sum which may be recovered as a result of the assessment of such costs and expenses against the property involved, as provided for in said Health and Safety Code.

SEC. 96.121.3 — REASSESSMENT

If any assessment made pursuant to the provisions of this ordinance is void or unenforceable for any reason, the Council may order a reassessment to be made in accordance with the provisions, so far as applicable, of Section 96.121 hereof.

SEC. 96.122 — INTERFERENCE — PROHIBITED

It shall be unlawful for any person to obstruct, impede or interfere with any representative of the Department, or with the inspector of any department of this City, or with any person who owns or holds any estate or interest in any building or structure which has been ordered to be repaired, vacated and repaired, demolished or removed, or with any person to whom such building or structure has been lawfully sold pursuant to the provisions of this Division, whenever any such representative of the Department, inspector, purchaser or person having an interest or estate in such building or structure is engaged in repairing, vacating and repairing, or demolishing any such building or structure pursuant to the provisions of this Division, or in performing any necessary act preliminary to or incidental to such work; or authorized or directed pursuant hereto.

SEC. 96.123 — LIABILITY OF OFFICERS OR EMPLOYEES OF THE CITY

(a) No officer, agent, or employee of the City of Los Angeles shall be personally liable for any damage incurred or alleged to be incurred as a result of any act required, permitted or authorized to be done or performed in the discharge of his duties pursuant to this division.

(b) Any suit brought against any officer, agent or employee of the City of Los Angeles as a result of any act required, permitted or authorized in the discharge of his duties under this Division shall be deemed an action against the City and shall be defended by the City Attorney.

SEC. 96.124 — DUTIES OF FIRE DEPARTMENT

The employees of the Fire Department shall make reports in writing to the Depart-

ment of Building and Safety of any building or structure as to which there is cause to believe that the same is a dangerous building or substandard residential building within the terms of this Division, whenever the facts thereof shall come to the attention of any such employee in the course of his regular duties.

SEC. 98.125 — DUTIES OF THE CITY ATTORNEY

(a) Appear, at the request of the Board or the Superintendent of Building, at any hearing before that Board or said Superintendent, in regard to dangerous buildings or substandard residential buildings.

(b) Take such legal action as is necessary to carry out the terms and provisions of this Division.

SEC. 98.126 — REPAIRS TO BE MADE IN ACCORDANCE WITH BUILDING REGULATIONS

Nothing in this Division shall be deemed to permit or authorize any violation of Article 1 of Chapter 9 of the Los Angeles Municipal Code and no repair, alteration or reconstruction shall be made except in the manner required by the provisions of said Article and Chapter.

SEC. 98.127 — OTHER PROVISIONS OF THE MUNICIPAL CODE UNAFFECTED HEREBY

The provisions of this Division shall not be deemed to repeal by implication any other provision of the Los Angeles Municipal Code, and the adoption hereof shall not be deemed to affect or diminish the power or authority of any officer or employee of the City to condemn any building or structure erected or maintained in violation of any other provision of said Code.

SEC. 98.128 — SEPARABILITY OF PROVISIONS THIS DIVISION

The City Council hereby declares that it would have adopted each separate provision of this Division, regardless of the adoption of any other provision, and if any remedy provided for in this Division be held unavailable or limited in effect, such limitation shall not affect the application of any other provision of this Division.

EXCERPTS FROM LOS ANGELES MUNICIPAL CODE, ARTICLE 8, CHAPTER 9

GENERAL ADMINISTRATIVE PROVISIONS

SEC. 98.0105 — INSPECTIONS

(a) Whenever it is necessary to make an inspection to enforce any of the provisions of or perform any duty imposed by this Chapter or other applicable law, or whenever the Superintendent of Building or his authorized representative has reasonable cause to believe that there exists in any building or upon any premises any violation of the provisions of this Chapter or other applicable law, or any condition which makes such building or premises hazardous, unsafe or dangerous, the Superintendent of Building or his authorized representative is hereby authorized to enter such property at any reasonable time and to inspect the same and perform any duty imposed upon the Superintendent of Building by this Chapter or other applicable law; provided that:

(1) If such property be occupied, he shall first present proper credentials to the occupant and request entry explaining his reasons therefor; and

(2) If such property be unoccupied, he shall first make a reasonable effort to locate the owner or other persons having charge or control of the property and request entry, explaining his reasons therefor. If such entry is refused or cannot be obtained because the owner or other person having charge or control of the property cannot be found after due diligence the Superintendent of Building or his authorized representative shall have recourse to every remedy provided by law to secure lawful entry and inspect the property.

(b) Notwithstanding the foregoing, if the Superintendent of Building or his authorized representative has reasonable cause to believe that the building or premises is so hazardous, unsafe or dangerous as to require immediate inspection to safeguard the public health or safety, he shall have the right to immediately enter and inspect such property, and may use any reasonable means required to effect such entry and make such inspection, whether such property be occupied, or unoccupied, and whether or not permission to inspect has been obtained. If the property be occupied, he shall first present proper credentials to the occupant and demand entry, explaining his reasons therefor and the purpose of his inspection.

(c) No person shall fail or refuse, after proper demand has been made upon him as provided in Subsection (b) of this section, to promptly permit the Superintendent of Building or his authorized representative to make any inspection provided for by Subsection (b) of this section. Any person violating this subsection shall be guilty of a misdemeanor.

(d) The applicant, by accepting any permit issued pursuant to this Chapter, does thereby consent and agree to the entry upon the premises described in the permit by Department personnel for the purpose of conducting such inspections as are required by applicable laws.

SEC. 98.0402 — INVESTIGATION AND COLLECTION FEES REQUIRED

(a) Investigation Fee Required. Whenever any work has been commenced without authorization by a permit or application for inspection, as required by the provisions of Chapter IX of this Code, a special investigation shall be made prior to the issuance of the permit or application for inspection and an investigation fee of \$75.00 shall be collected on each permit or application for inspection so investigated.

EXCEPTION: When a single order to comply is written for unauthorized work in a one- or two-family dwelling, or a building or structure accessory thereto, and the unauthorized work involves more than one Article of Chapter IX, a single investigation fee of \$25.00 shall be collected.

The payment of the investigation fee shall not exempt any person from compliance with the provisions of the Code nor from any penalty prescribed by law.

(b) Collection Fee for Delinquent Invoices for Boilers, Pressure Vessels and Elevators.

Whenever an owner or user of any apparatus or equipment fails to pay the fees required by Sections 92.0134 and 97.0314 within 60 days after notification, said owner or user shall pay, additionally, a collection fee equal to 50% of the required fee under Sections 92.0134 and 97.0314.

SEC 98.0403 — POWERS OF DEPARTMENT AND BOARD; APPEALS AND REQUESTS FOR SLIGHT MODIFICATIONS

1. Statement of Powers.

(a) The Department of Building and Safety is granted the power, by the City Charter, to enforce all ordinances and laws relating to the construction, alteration, repair, and demolition, or removal of buildings or structures in the City, and to the installation, alteration, repair, use, and operation of all heating, plumbing, lighting, ventilating, refrigerating, electrical and mechanical appliances and equipment therein.

(b) The power granted to the Board of Building and Safety Commissioners under Charter Section 93 is hereby restricted to the hearing of and action on appeals from decisions of the Superintendent of Building pursuant to the power granted him by this subsection.

The Superintendent of Building shall have the power to hear and determine requests for slight modifications for individual cases in the provisions of the building ordinances of the City (Chapter 9), and in the yard area requirements of the zoning ordinance, provided that in each such modification the Superintendent shall first find that a special, individual reason makes the strict letter of the ordinance impractical and that the modification is in conformity with the spirit and purpose of the ordinance involved. Any such action granting modifications shall be recorded and entered in the files of the Department.

(c) The Department of Building and Safety is hereby granted the power to enforce all ordinances and laws relating to grading.

(d) The Department of Building and Safety shall have the power and duty to enforce all portions of the Rules and Regulations of the State Fire Marshal which relate to the construction, alteration, repair, demolition, or removal of buildings, or structures, and to the use and operation of all heating, plumbing, lighting, ventilating, refrigerating, electrical, and mechanical appliances therein. Provided, however, that no application for modification of specific provisions of the Rules and Regulations of the State Fire Marshal shall be granted by the Department of Building and Safety, unless and until such application shall be first submitted to the Chief Engineer of the Fire Department or his representative for report and recommendation with respect thereto.

(e) The Department of Building and Safety shall have the power and duty to enforce those rules and regulations adopted by the Energy Resources Conservation and Development Commission of the State of California pursuant to Section 25402 of the Public Resources Code and contained in the California Administrative Code, Title 24, Part 6, Division T20, Chapter 2, Subchapter 4, Articles 1 and 2, establishing standards for energy insulation and energy conservation with respect to residential and nonresidential buildings.

2. Appeals to the Board and Requests for Slight Modifications.

(a) For purposes of appeal, the Board's jurisdiction shall mean the right to hear and determine appeals from determinations, orders or actions of the Department or the Superintendents of Building pertaining to enforcement of the Codes under the jurisdiction of the Department.

(b) The jurisdiction of the Superintendent shall include the right to hear and determine requests for slight modifications from the provisions of Chapter 9 of the Los Angeles Municipal Code or the yard area requirements of Article 2 of Chapter 1 of said Code.

(c) Such appeals or requests shall be made in writing, upon appropriate forms provided therefor by the Department, and the grounds thereof shall be stated clearly and concisely. No appeal shall be considered by the Board or request considered by the Superintendent except upon the grounds stated.

(1) With respect to appeals from determinations, orders or actions of the Department or the Superintendent of Building, the appellant shall state wherein he believes there is an error or an abuse of discretion in the matter appealed from. Such appeals shall be filed with the Board no later than the last day upon which compliance with the determination, order or action appealed from is required.

(2) With respect to requests to the Superintendent for slight modifications from the provisions of Chapter 9 of the Los Angeles Municipal Code or the yard area requirements of Article 2 of Chapter 1 thereof, the person making the request shall state the special, individual reason which makes compliance with the strict letter of the provisions in question impractical, and shall show that the modification requested is in conformity with the spirit and purpose of said provisions, all as required by Section 93 of the Los Angeles City Charter.

(3) If the Board determines that evidence is required to be taken or that further

TABLE 4-A FILING FEES FOR BOARD APPEALS BUILDING & MECHANICAL CODES

Occupancy	V	Type of Building* (First Item)	IV	III	I & II	Each Additional Item
R	\$25		\$25	\$25	\$ 25	\$ 5
H	50		50	75	95	20
J & F	50		50	75	95	20
G & E	50		50	75	125	20
D & S	65		65	95	125	25
A & B	65		65	95	125	25
Misc.	50		50	75	125	20

*Accessory buildings, structures or appendages will be considered the same as main building or occupancy.

TABLE 4-B FILING FEES FOR BOARD APPEALS GRADING AND SOIL REQUIREMENTS

	Construction Requirements	Unstable Soil or Geology	Each Additional Item
1 - 5 lots	65	125	25
6 or more lots	125	250	65

Investigation is necessary to decide any such appeal, the Board may refer the matter to a hearing examiner for hearing and report in accordance with the provisions of Section 89 of the Los Angeles City Charter or may refer the matter to the Superintendent for further investigation and report, whichever is deemed most appropriate.

(4) The Superintendent or his authorized representative may hold any hearings deemed most appropriate to consider requests for slight modifications or matters referred by the Board.

(d) In the case of a single building, appeals to the Board of Building and Safety Commissioners shall be accompanied by a filing fee as set forth in Table 4-A. The filing fee shall cover the first item appealed or requested. An additional fee as shown in the table shall be charged for each other and separate item on the same request.

Appeals to the Board of Building and Safety Commissioners concerning grading or soil requirements shall be accompanied by a filing fee as set forth in Table 4-B. The filing fee shall cover the first item appealed or requested. An additional fee as shown in the table shall be charged for each other and separate item on the same request.

All other appeals to the Board of Building and Safety Commissioners not otherwise covered by the foregoing paragraphs in this subdivision shall be accompanied by a filing fee equal to one-half of the application fee of the item being appealed from and relating thereto, but such filing fee shall not be less than \$50.

(e) No filing fee shall be required on any request for modification or approval which becomes necessary as a result of a survey conducted by the Department of Building and Safety in a building appropriated to the housing of only one family.

(f) In any appeal for modification or approval, the appellant or person making such request shall cause to be made, at his own expense, any tests required by the Board or the Superintendent to substantiate his claims.

(g) All findings and/or determinations made by the Board or the Superintendent shall conform to the spirit and intent of those parts or provisions of Chapter 9 of this Code which are applicable thereto.

SEC. 98.0405 — CHARGES FOR PRINTED MATERIALS

The Department shall collect the following amount for the items shown prior to providing such materials to members of the public. The charges therein established shall be sufficient to fully compensate the City for all expenses incurred in the preparation, production, handling and distribution of the items listed and including general overhead expenses. The Superintendent of Building shall periodically review such charges to insure that all applicable expenses to the City are fully compensated.

ITEM	CHARGE
"Certificate of Inspection and permit to Operate Steam Boiler or Pressure Vessel" Form M-1	\$3.00 per pad (100)
"Elevator Reinspection Report" Form M-9	\$3.00 per pad (75)
"Elevator Inspection Report" Form M-46	\$3.00 per pad (50)
"Research Report Index"	\$3.00 per copy

98.0406 — INSPECTION FEES FOR OFF HOURS INSPECTIONS. The Department may, at its discretion, make inspections at other than normal working hours upon application therefor by a permittee. A fee in addition to fees charged elsewhere in this Code, at the rate of \$40.00 per hour shall be charged for such inspections, time to include travel to and from place to inspection, with a minimum of \$110.00.

SEC. 98.0407 — SPECIAL ENFORCEMENT PROCEDURE FEES. Whenever special enforcement procedures are required to obtain compliance with properly executed Departmental orders that apply to application for inspection of Construction Permits, a fee of \$20.00 shall be assessed in addition to fees specified elsewhere in the Municipal Code.

SEC. 98.0501 — ALTERNATE MATERIALS, DEVICES AND METHODS OF CONSTRUCTION

(a) General Approvals. The provisions of this Code are not intended to prevent the use of any material, device, or method of construction not specifically prescribed by this Code, provided any such alternate has been approved and its use authorized by the Department. For the purpose of this section, "General Approval" means approval by the Department of any device, material or method of construction which is not specifically provided for in Chapter 9.

The Department may grant a general approval for any such alternate, provided it finds the device, material or method of construction offered is, for the purpose intended, at least the equivalent of that prescribed in the Code in quality, effective time period of fire resistance, strength, effectiveness, durability and safety. The Department shall require that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding the adequacy of any such device, material or method of construction.

(b) Fees and Term of General Approval and Renewal. The application fee for a new General Approval for a new material or new method of construction pursuant to Articles 1, 2, 3, 4, and 5 of Chapter IX of this Code shall be \$350.00 for the first year of approval. Thereafter the application for renewal of a General Approval shall be accompanied by a fee of \$130.00.

A fee of \$200.00 shall accompany each application for a technical modification of a General Approval. A fee of \$50.00 shall accompany each application for a clerical modification.

The fees for new General approvals and Technical Modifications include four hours of Departmental processing time. The fees for renewals and clerical modifications include one hour of Departmental processing time.

The applicant shall agree in writing, as part of the application, to pay supplemental fees at the rate of \$20.00 per hour to cover the time of processing which is in excess of the amount of time provided for in the approval, renewal, or modification fee specified in this section. Processing shall include those activities directly related to the General Approval for which application has been made and shall include all research, review, correspondence, clerical and consultation time pertinent to the application. The Department may require an estimated supplemental fee to be paid at the time of filing the application; however, the supplemental fee shall be paid in full prior to final action on the application by the Department.

The fees specified in this section, including supplemental fees, are application fees and are not refundable, regardless of whether the action taken is approval or denial. EXCEPTION: Supplemental fees paid in advance which are in excess of the total actual fees are refundable.

(c) **Validity of General Approvals.** Any General Approval shall be void if, after approval, the device, material or method of construction is found to deviate in any way from the approved device, material or method of construction, without having first obtained written authorization by the Department.

Any General Approval may be suspended or revoked by the Superintendent if the Department finds the approved device, material or method of construction does not meet the requirements of Subsection (a) of this section, or finds it does not comply with other applicable sections of the Los Angeles Municipal Code to such an extent that the general approval should not have been granted.

In any action to deny a request for approval or to suspend or revoke an approval, the procedure prescribed by the applicable provisions of this Article shall be followed.

In any action to suspend or revoke an approval, the procedures prescribed by the provisions of this Article shall be followed.

SEC. 98.0502 — APPLIANCES, FIXTURES AND EQUIPMENT

(d) **Laboratory Fees.** The application for a new approval pursuant to Articles 3, 4 and 5 of Chapter IX of this Code shall be accompanied by a laboratory fee of \$160.00. Thereafter the application for renewal of an approval shall be accompanied by a fee of \$100.00. The fees specified include three hours of laboratory processing time.

A supplemental fee at the rate of \$20.00 per hour shall be due for all time over three hours spent in receiving, set-up, testing, reporting, photographing, clerical and consultation directly related to the application for approval or renewal.

The applicant shall agree in writing, as a part of the application, to pay supplemental fees to cover the cost to the City incurred by the application, including charges for processing time, field travel time and mileage, and special charges which shall be in addition to any application filing fee.

Certain supplemental fees are as follows:

Item	Fee
1. Field travel time and mileage — based on one-way radius distance from laboratory to test site. (Field testing, consultation and standby time directly related to the application is cumulative as processing time specified in this subsection.)	\$15.00 per trip — not more than 15 mile radius. \$25.00 per trip — not more than 30 mile radius. More than 30 mile radius — \$25.00 plus \$0.75 per radius mile beyond 30 miles.
2. Reopening application file closed for failure to submit corrected sample within authorized time limit — not applicable after one year from date of application.	\$30.00
3. Reopening approval file closed for failure to renew within time limit — not applicable after one year from expiration date.	\$30.00
4. Multiple listings — additional models, product or firm names on approved items at time of approval or renewal.	\$10.00
5. Modification of approval — revision of names and/or model numbers under current approval, requiring no testing or examination.	\$20.00

The Department may require a deposit to cover the estimated total supplemental fee to be paid in advance. The total actual cost of the application shall be determined by the Department on the basis of fees established by ordinance and shall be paid by the applicant whether or not an approval is granted. Supplemental fees paid in advance which are in excess of the total actual cost are refundable.

The fee for labels required by Subsection (i) for all electrical equipment approved by the Department shall be four and one-half cents for each label.

SEC. 98.0503 — TESTING AGENCIES

Whenever tests or certification of any material or fabricated assembly thereof, or of any persons, are required by this Chapter, such tests or certification shall be made by a testing agency approved by the Superintendent to conduct such tests or provide such certifications. Approvals of testing agencies shall be issued for a period of one year and may be renewed for additional one-year periods.

(a) The Superintendent shall establish rules and regulations setting forth conditions

and provisions precedent to the issuance of any such approval and for the conduct of any person or agency so approved.

(b) A fee of \$350.00 shall accompany each application for approval and a renewal fee of \$175.00 shall accompany each application for renewal. A fee of \$200.00 shall be charged for the approval of each branch office in addition to the main office. A fee of \$200.00 shall accompany each application for a major modification and a fee of \$50.00 shall accompany each application for clerical modification.

EXCEPTION: Application fees shall not be required from agencies established and operating on a nonprofit basis, and (1) which have an approved reinspection service, or (2) which are governmentally operated universities, colleges or testing facilities.

In the event an application for approval is denied, one-half of the fee shall be refunded if such refund is requested within one year from the date of the payment thereof.

(c) The Superintendent may suspend or revoke an approval upon evidence of failure of the agency or person so approved to properly conduct any test or certify any material or assembly of material in a manner required by Chapter 9, or for any of the reasons set forth in this Article.

In any action to suspend or revoke an approval, the procedure prescribed by the provisions of this Article shall be followed.

DIVISION 6—EXPIRATION AND REVOCATION OF PERMITS. PLAN CHECK, AND SLIGHT MODIFICATIONS

SEC. 98.0601 — PURPOSE

The purpose of this Division is to establish requirements and procedures for the revocation of permits issued by the Department and to establish time limits for the validity of permits, plans checks and slight modifications.

SEC. 98.0602 — REVOCATION

The Superintendent of Building or the Board shall revoke any permit or slight modification whenever a false statement or misrepresentation has been made on the permit application or the appeal form as to a material fact on which the permit was issued or upon which the slight modification was granted. Any permit or slight modification shall also be revoked whenever the permit was issued or the slight modification was granted in error or in violation of other provisions of the Municipal Code and conditions are such that a permit or slight modification should not have been issued or granted.

SEC. 98.0603 — EXPIRATION OF PERMITS

(a) Every permit issued shall be valid for a period of two years from the date thereof; provided that any permit shall expire on the one hundred and eightieth day from date of issuance if the work permitted thereunder has not been commenced; or shall expire whenever the Department determines the work authorized by any permit has been suspended, discontinued or abandoned for a continuous period of 180 days.

EXCEPTION: If the holder of any permit issued by the Department presents satisfactory evidence that unusual construction difficulties have prevented work from being started or continued without being suspended within the 180 day time period or completed within the two year period of validity, the Department or the Board may grant extensions of time reasonably necessary because of such difficulties.

Notwithstanding the provisions of this subsection the validity of a permit may be further restricted in the following conditions:

1. In the case that a building or structure has been ordered repaired or demolished in accordance with Subsection 91.0103(o), 91.4934(a), or Division B of Article 6 of Chapter 9 of the Los Angeles Municipal Code such time limits as are specified therein shall apply.

2. The Superintendent or the Board may, because of unusual circumstances or conditions such as but not limited to: the demolition of an imminently hazardous building, or a grading operation which may be subject to flooding during the rainy season, impose restrictions upon the time limits for expiration of any permit.

3. The time limit of validity of relocation permits shall be as specified in Section 91.5407 of the Los Angeles Municipal Code.

4. The time limit of validity of tent permits shall be as specified in Section 91.1709 of the Los Angeles Municipal Code.

The limited validity time shall be noted on all permit copies.

(b) Permits which have expired shall have the site, building or project restored to the condition which existed immediately prior to the commencement of work described by such permits.

SEC. 98.0604 — EXPIRATION OF PLAN CHECK

If a permit is not secured within one year after plans have been filed for checking such plan check shall expire and no permit shall be issued until the plans are rechecked and approved and a new plan check fee paid.

EXCEPTION: The Department or the Board may grant extensions of time if a permit applicant submits in writing sufficient evidence that unusual conditions or circumstances precluded the securing of the permit within the allocated time.

SEC. 98.0605 — EXPIRATION OF SLIGHT MODIFICATIONS

The rights and privileges granted by the Superintendent or the Board under a slight modification shall be voided if the permit is not secured within one year of the date the modification was granted or if the permit expires under any of the conditions specified in Section 98.0603.

EXCEPTION: The Department or the Board may grant extensions of time if a permit applicant submits in writing substantial evidence that unusual conditions or circumstances precluded the securing of the permit within the allocated time or caused the permit to expire as specified in Section 98.0603.

SEC. 98.0606 — TIME LIMITS OF REQUESTS FOR EXTENSIONS

Requests for extensions of time on the expiration times of permits, plan checks and slight modifications shall be made not later than 30 days after the expiration times specified in this division.

INDEX

Subject — Section

PAGE

Subject — Section

PAGE

— A —

ACCESSORY BUILDING

Dwelling (see DWELLINGS)

Dwelling, definition —

Sec. 91.4801(b), 4902 373, 408

Dwelling, slabs for —

Sec. 91.4801(g) 376

General definition—Sec. 91.0403(a) 45

Horizontal forces—Sec. 91.2305 134-145

Mudslills for—

Sec. 91.1708, 4807(h) 124, 376

Slabs for—

Sec. 91.1708(c), 4807(g) 124, 376

Weatherproofing—Sec. 91.4813 385-393

ACETYLENE VAULTS (see HAZARDOUS MATERIAL ROOM)

ADDITIONS TO BUILDINGS

Definition of—Sec. 91.0403(a) 45

In fire districts—Sec. 91.1602 112

Out of fire districts—

Sec. 91.0103(d) 16

ADJACENT BUILDINGS

Exterior openings, Fire District No. 1—

Sec. 91.1604 113-114

Exterior openings, general—

Sec. 91.0504, 1704 62-63, 116

Property, line between—

Sec. 91.0504(d) 62

Protection, excavation—

Sec. 91.2801(b) 247

Exterior openings, E occupancy—

Sec. 91.1051 93

Walls, E occupancy—Sec. 91.1051 .. 93

Yards for explosive material—

Sec. 91.1071(d) 98

ADMINISTRATION

Alternate materials, methods—

Sec. 91.0303 30

Appeals to Board—Sec. 91.0304 30

Application for permit—Sec. 91.0203. 21

Application for plan checking—

Sec. 91.0208 25

Approval of plans (see PLANS)—

Sec. 91.0211 27-28

Authority of Department—

Sec. 91.0301 30

Authority to condemn—Sec. 91.0308. 32

Authority to stop use—Sec. 91.0307. 32

Authority to stop work—Sec. 91.0305 32

Buildings, fire separations—

Sec. 91.0503 61

Called inspections—

Sec. 91.0309, 4801 34-35, 373

Certificate of occupancy—

Sec. 91.0315 41-43

Change of occupancy—

Sec. 91.0315(b) 42

Code does not apply—

Sec. 91.0102 13-15

Code modifications—Sec. 91.0301 30

Code, purposes of—Sec. 91.0101 13

Code revision—Sec. 91.0316 43

Compliance, report of—

Sec. 91.0314 41

Concealing of work—Sec. 91.0306 .. 32

Condemnation of buildings—

Sec. 91.0308 33

Conflicting provisions—

Sec. 91.0102(a) 13

Continuous inspection—

Sec. 91.0301(a) 36

Department's responsibility—

Sec. 91.0301(c) 36

Deputy inspectors, registered—

Sec. 91.0311 38-39

Deviations, minor—Sec. 91.0301 30

Duties of deputy inspectors—

Sec. 91.0311(b) 39

Enforcement of Code—Div. 3 30

Examinations of deputy inspectors—

Sec. 91.0311 38-39

Exemptions from Code—

Sec. 91.0102(b) 13-15

Exemptions from permits—

Sec. 91.0201 20-21

Expiration of permits—

Sec. 91.0206(b) 24

Fees, permit—Sec. 91.0204 22-23

Fees, plan checking—

Sec. 91.0209 25-26

Grades, official—Sec. 91.0202(c) 21

Grading, Plan check fees—

Sec. 91.0209(a) 25

Inspections (see INSPECTIONS)—

Sec. 91.0309, .0319 34-35; 36-38

Inspections, concrete—

Sec. 91.2601.4 220

Inspections, dwelling—

Sec. 91.4801(c) 373

Inspectors, deputy, registered—

Sec. 91.0310, .0311 36-38; 38-40

Interference with Department—

Sec. 91.0302 30

Issuance of certificate—

Sec. 91.0315 41-43

Maintenance of buildings—

Sec. 91.0103(a) 15

Modification—Sec. 91.0301 30

Occupancy, certificate of—

Sec. 91.0315 41-43

Occupancy, change of—

Sec. 91.0315(b) 41

Occupancy, prevention of—

Sec. 91.0307 32

Occupancy, separation of—

Sec. 91.0503 60

Permit cards—Sec. 91.0205 23

Permit expiration—Sec. 91.0206(b) .. 24

Permit must be followed—

Sec. 91.0313 41

Permits not required—

Sec. 91.0102, .0201 13-15; 20-21

Permits required—

Sec. 91.0201, .0203 20-21; 21

Permits, withholding of—

Sec. 91.0203 21

Permits, revocation of—

Sec. 91.0206 24

Permittee responsible—Sec. 91.0313. 41

Plans (see PLANS)—

Sec. 91.0207, .0209 25; 25-26

Plans on job—Sec. 91.0211(e) 28

Purpose of Code—Sec. 91.0101 13

Registered deputy inspectors—

Sec. 91.0310, .0311 36-38; 38-40

Registered deputy duties—

Sec. 91.0311(b) 39

Report of compliance—Sec. 91.0314. 41

Scope of Code—Sec. 91.0102 14-15

Separation of occupancies—

Sec. 91.0503 60

Site plat—Sec. 91.0207,

.0309(c) 25; 35

Stopping of work—Sec. 91.0305 32

Title of Code—Sec. 91.0101 13

Work, concealing of—Sec. 91.0306. 32

ADOBE (see UNBURNED CLAY

MASONRY)—Sec. 91.2405 157-158

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Subject — Section	PAGE	Subject — Section	PAGE
CEMETERY EXCAVATION (Exempted from Code)—Sec. 91.0102(a)	13	COMBUSTIBLE (see INCOMBUSTIBLE)—	
CERAMIC TILE		Sec. 91.1703, .1706	117, 121-123
Food establishments—Sec. 91.0508 ..	65	COMMUNICATING OPENINGS —	
Floors—Sec. 91.0508(c)	66	Sec. 91.0503	60
Garbage rooms—Sec. 91.0508(l) ..	69	COMPLIANCE CERTIFICATE —	
Walls and ceilings—		Sec. 91.0314, .0315	41, 42
Sec. 91.0508(h)	67	COMPOSITE ROOFING (see ROOFING)	
Shower and Shower Bath		COMPUTATIONS REQUIRED —	
Enclosures—Sec. 91.4909(d)	420	Sec. 91.0210(b)	27
Toilet rooms		COMPRESSION MEMBERS	
Construction—Sec. 91.0508(i)5 ..	68	Design—Sec. 91.2507	184
Veneered walls		Solid wood—Sec. 91.2507(a)1	184
Adhesive veneer—Sec. 91.2902(a) ..	258	Spaced compression—	
Tied veneer—Sec. 91.2904	261	Sec. 91.2507(a) (2)	184
Veneer backing—Sec. 91.2903	260	Mechanical laminated compression—	
Veneer, definition—Sec. 91.0403(v) ..	51	Sec. 91.2507(a) (3)	184
CERTIFICATE		CONCRETE	
For cement, concrete—		Admixtures—Sec. 91.2603.6	223
Sec. 91.2603.2.3	221	Aggregates—Sec. 91.2603.3	222
For fire doors—Sec. 91.4307(c)	343	Anchor bolts—Sec. 91.2608.11	230
For registered deputy inspector—		Anchorage of reinforcement—	
Sec. 91.0311	38-39	Sec. 91.2612	230
For reinforcing steel—		Beams—Sec. 91.2608	230
Sec. 91.2603.5.14	223	Beams, composite—	
For treated wood—		Sec. 91.2617	231
Sec. 91.3101(b)	281	Blocks, fire rating—	
Of compliance—Sec. 91.0314	41	Sec. 91.4305	339
Of occupancy—Sec. 91.0315	41-43	Blocks, masonry walls—Div. 24	151
CERTIFICATION —Sec. 91.0310(i) ..	37	Block partitions—Sec. 91.2412	163
CHANGE OF OCCUPANCY —		Bond and anchorage—	
Sec. 91.0103, .0315(b)	15, 41	(See Development of Reinforcement)	
CHASES AND RECESSES (Masonry)—		Boxes and pipes in—	
Sec. 91.2417(d)	168	Sec. 91.2617(d)	231
CHIMNEYS (see HEATING)		Braced frames—Sec. 91.2623	240
Connections to—		Brick, quality of—	
Sec. 91.3701, .3705	321, 313	Sec. 91.2403	151-155
For dwellings—		Brick, use of—Div. 24	151
Sec. 91.4822, .4823	401-405	Ceilings, fire resistance—	
Horizontal force design—		Sec. 91.4306	339
Sec. 91.2305	134-145	Cement for—Sec. 91.2603.2	221
Masonry, general—		Cement tests for—	
Sec. 91.3701, .3702	312, 312-313	Sec. 91.2603.2	221
Metal Stack—Sec. 91.3704	313	Classification of—Sec. 91.2601.2	220
Smoke pipe to—Sec. 91.3705	313	Cleaning of reinforcement—	
Terra Cotta—Sec. 91.3703	313	Sec. 91.2607.2	228
CLEANING (Exempted from Code)—		Columns—Sec. 91.2610	230
Sec. 91.0102(b)	13-15	Columns, fire protection—	
CLUBS (see GROUP B and H)		Sec. 91.4304	334
CODE REVISION —Sec. 91.0316	43	Computations—Sec. 91.0210	27
COLD STORAGE (see FOOD ESTABLISHMENTS)		Concrete requirements—	
COLUMNS (see CONCRETE, MASONRY etc.)		Sec. 91.2603-2606	221, 228
COMBINED STRESS (see STRESSES)		Construction joints—	
COMBINING OF ADMIXTURES		Sec. 91.2606.4	228
Concrete mix—Sec. 91.2603.6	223		

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Subject — Section	PAGE	Subject — Section	PAGE
Continuous inspection—		Precast—	
Sec. 91.0309, .0310	34-35, 36-38	Sec. 91.2616	230
Conveying and depositing—		Prestressed—	
Sec. 91.2605	228	Sec. 91.2618	231
Core tests—Sec. 91.2604.3	227	Proportions of—Sec. 91.2604.2	224
Curing of—		Protection of reinforcement—	
Sec. 91.2605.5	228	Sec. 91.2607.14	229
Definitions—Sec. 91.2602	221	Ready mixed—Sec. 91.2605	228
Depositing and conveying—		Ready mixed, inspection—	
Sec. 91.2605	228	Sec. 91.2601.4	221
Design assumptions—		Reinforced concrete walls—	
Sec. 91.2608	230	Sec. 91.2614	229
Design moments for—		Reinforced concrete columns—	
Sec. 91.2608.4	230	Sec. 91.2610	230
Design of earthquake—		Reinforcement details—	
Div. 23	131	Sec. 91.2607	228
Design of general—		Reinforcement development of—	
Div. 26	220	Sec. 91.2612	229
Design of retaining walls—		Reinforcement, compression—	
Sec. 91.2309	147	Sec. 91.2610	230
Details of reinforcement—		Reinforcement, hooks for—	
Sec. 91.2607	228	Sec. 91.2607.1, .2612.8	228, 230
Development of reinforcement—		Reinforcement, minimum—	
Sec. 91.2612	230	Sec. 91.2610.5, .2614.2	230
Diagonal tension in—		Reinforcement, placing—	
(See SHEAR)		Sec. 91.2607.3	228
Ductile frames—Sec. 91.2622	235	Reinforcement, shrinkage—	
Earthquake, design of—Div. 23	131	Sec. 91.2607.13	229
Equipment—Sec. 91.2605	228	Reinforcement specifications—	
Fire protection for—Div. 43	331	Sec. 91.2603.5	223
Fire resistance of—Div. 43	331	Removal of forms—	
Flexural members—		Sec. 91.2606.2	228
Sec. 91.2610	230	Retaining walls, general—	
Floors, fire resistance—		Sec. 91.2309	148
Sec. 91.4306	339	Rock for—Sec. 91.2603.3	222
Floors, on wood—		Sand for—Sec. 91.2603.3	222
Sec. 91.2308, .4810(h)	147, 379	Shear and diagonal tension—	
Footings, design of—		Sec. 91.2611	230
Sec. 91.2615	230	Shearing stress—Sec. 91.2611.2	230
Footings for dwellings—		Shear walls and braced frames—	
Sec. 91.4807	375	Sec. 91.2623	240
Footings for Type V—		Shoring—Sec. 91.2606	228
Sec. 91.1708(b)	124	Shrinkage, reinforcing—	
Footings, soil and design—Div. 28	247	Sec. 91.2607.13	229
Forms for—Sec. 91.2606	228	Slabs on ground—Sec. 91.1708(c),	
Formula symbols—(See		.4807(g), .4810(h)	124, 376, 382
SPECIFIC SECTIONS)		Shells and folded plates—	
General requirements—		Sec. 91.2619	232
Sec. 91.2601	220	Slabs, one-way—Sec. 91.2610.6	232
Grades of—Sec. 91.2601	220	Slabs, two-way—Sec. 91.2613	229
Gunite—Sec. 91.2621	233	Slump—Sec. 91.2604.2.2	225
Hooks for reinforcement—		Splices in reinforcement—	
Sec. 91.2607	228	Sec. 91.2607	228
Inspection—Sec. 91.2601.4	220	Steel for—Sec. 91.2603.5	223
Inspection, continuous—		Stirrups for—Sec. 91.2607.11	229
Sec. 91.0309, .0310	34-35, 36-38	Strength of—Sec. 91.2604	224
Joints—Sec. 91.2606.4	220	Strength design of—Sec. 91.2609	230
Joists—Sec. 91.2608.8	230	Strength, evaluation of in existing	
Lightweight aggregates—		structures—Sec. 91.2620	232
Sec. 91.2603.3	222	Stress, bond—(See DEVELOPMENT	
Load, tests for—Sec. 91.2620	232	OF REINFORCEMENT)	
Loads, live, in—Div. 23	131	Stress, shearing—Sec. 91.2611	230
Metal reinforcement requirements—		Structural inspection—	
Sec. 91.2603.5, .2603.8,		Sec. 91.0310(h)	37
.2607	222, 228	Temperature reinforcement—	
Mix for dwellings—		Sec. 91.2607.13	229
Sec. 91.4806(d)	375	Tension in footings—	
Mixes, general—Sec. 91.2604	224	Sec. 91.2611.10	230
Piles—Sec. 91.2807	252	Testing cement for—Sec. 91.2603.2	221
Pipes and boxes in—		Testing of—Sec. 91.2604.3	227
Sec. 91.2606	228	Testing of aggregates—	
Placing of—Sec. 91.2605	228	Sec. 91.2603.3	221
Plans for—Sec. 91.0210	27	Testing steel for—Sec. 91.2603.5	222
Pneumatically placed—		Torsion—Sec. 91.2611	230
Sec. 91.2621	233	Two-way slabs—Sec. 91.2613	229
Portland cement—Sec. 91.2603.2	222	T-beams—Sec. 91.2608.7	230
		Walls, design of—Sec. 91.2614	236

Subject — Section	PAGE
Walls, fire resistance of— Sec. 91.4305	339
Water-cement ratio—Sec. 91.2604.2	224
Water for—Sec. 91.2603	222
Web reinforcement— Sec. 91.2607.1, .2611, .2612, .2613	228, 230
CONCRETE BLOCKS (see MASONRY)	
CONDEMNATION OF BUILDINGS— Sec. 91.0103, .0308	15-19, 32
CONNECTIONS (see DESIGN, STEEL, etc.)	
CONSTRUCTION (ON COMPACTED, FILLED GROUND) General requirements— Sec. 91.3009(c)	277
CONSTRUCTION (see CONCRETE, STEEL, MASONRY etc.) (see GROUP A, B, D, etc.) (see TYPE I, II, III, III-A, etc.) (see HOUSING REQUIREMENTS)	
CONSTRUCTION JOINTS, CONCRETE— Sec. 91.2606.4	228
CONSTRUCTION SAFETY AND SANITARY PROVISIONS— Sec. 91.4401	347
CONSTRUCTION, TOILET FACILITIES DURING— Sec. 91.4401	347
CORNICES Projection—Sec. 91.1705, .1706	118-121, 121-123
Materials—Sec. 91.4501, .4502	352-353
CORRIDORS (see EXITS and see GROUP A, B, etc.) General—Div. 33	289
CORRUGATED IRON OR STEEL— Sec. 91.3202(l), 4813(k)	287, 393
COUNTERS (Exempted from Code)— Sec. 91.0102(a)	13
COURT Definitions of—Sec. 91.0403, .4902	46, 408
Exit—Sec. 91.3304	295-296
Inner, construction—Sec. 91.1703, .1705	117, 118-121
Size—Sec. 91.4904	415-417
Window—Sec. 91.0403, .4904	50, 415-417
CREOSOTE— Div. 31	281
CURTAIN, proscenium— Sec. 91.3904(d)	318
CUTTING ROOMS (see CELLULOSE- NITRATE FILM—PROCESSING ROOMS)	

— D —

DEAD LOAD, definition— Sec. 91.2301	131
DEFINITIONS General terms—Sec. 91.0403	45-51
Special terms (see each Division)	
DEMOLITIONS Method—Sec. 91.4405	350
Permitted—Sec. 91.0103, .4405	15-19, 356
Protection for—Sec. 91.4401, .4402	347-349
Required, when—Sec. 91.0103, .0308	15-19, 32
DEPARTMENT (see ADMINISTRATION)	
DEPTH, FOUNDATIONS (see FOOTINGS AND FOUNDATIONS)	
DERRICKS, OIL Separation of—Sec. 91.0504(g)	62

Subject — Section	PAGE
Exempted from Code— Sec. 91.0102(a)	13
DESIGN Anchorage of web reinforcement— Sec. 91.2612	280
Anchorage Requirements— Sec. 91.2612	230
Compression members— Sec. 91.2507	184
Deflection—Sec. 91.2501(h)	178
Eccentric joints— Sec. 91.2506(e)	182
Exterior elements—Sec. 91.2305(k), 6.142	247
Foundations—Div. 28	247
General—Div. 23	131
Glued construction—Sec. 91.2511	187
Load duration—Sec. 91.2504(c)4	181
Lumber stresses—Sec. 91.2504	181
Masonry—Div. 24	151
Reinforced concrete—Div. 26	220
Steel—Div. 27	243
Veneer—Div. 29	258
Wood—Div. 25	177
DIAPHRAGMS Allowable loads— Sec. 91.2514(c), Tables 25-J, N	191, 216, 219
Design considerations— Sec. 91.2514(a)	191
Diagonal sheathing—Sec. 91.2514(b)	191
Fiberboard—Sec. 91.2515(a)	193
Plaster—Sec. 91.2515(b)(c)	193
Plywood—Sec. 91.2514(c)	192
Rotation—Sec. 91.2514(a)	191
Shape—Sec. 91.2514(a)	191
Wood limitation—Sec. 91.2516	194
DOORS (see FIRE DOORS)	
Boiler room—Sec. 91.0509, .0510, .3314	90, 304
Double acting, restriction— Sec. 91.3303(e)	294
Enclosing shaft— Sec. 91.1703(b)	117
Exit (see EXITS)— Sec. 91.3303	293
Fire (see FIRE DOORS)	
Food establishment—Sec. 91.0508.65-70	
Group A occupancies— Sec. 91.0604	73
Group B occupancies— Sec. 91.0704(a)	76
Group D occupancies— Sec. 91.0904	86
Group S occupancies— Sec. 91.0804(a)	80
Hazardous materials rooms— Sec. 91.3314(b)	304
Landings, general—Div. 33	289
Laundry chute door— Sec. 91.4307(h)	345
Projection room—Sec. 91.4003, .4004	319
Revolving, prohibition— Sec. 91.3303(e)	293
Rubbish chute doors— Sec. 91.4307(h)	345
Shaft enclosure—Sec. 91.1703(b)	117
Sliding or rolling, not required Exits—Sec. 91.3303(e)	293
Stage—Div. 39	316
Vault—Sec. 91.4104(g), .4105(i)	324, 325
DOWNSPOUTS Dwelling—Sec. 91.4812(t)	385
Marquee—Sec. 91.4509(e)	356
Roof—Sec. 91.3203(c)	288

Subject — Section	PAGE
DRAINAGE	
Exempted from Code—	
Sec. 91.0102(a)	13
Marquees—Sec. 91.4509(e)	356
Roof—Sec. 91.3203	288
DRAWINGS (see PLANS AND SPECIFICATIONS)	
DRESSING ROOMS	
Food establishments—	
Sec. 91.0508(j)	69
DRIVEWAYS (Exempted from Code)	
Sec. 91.0102(b)	13-15
DRYING ROOMS—Sec. 91.4110	327
DRY CLEANING (see HAZARDOUS MATERIALS)	
(Exempted from Code)—	
Sec. 91.1001(b)	88
DUCTS (see VENTILATION)	
Air shutters for—	
Sec. 91.4307(g)	345
Projection room—Sec. 91.4005	319-320
DUCTILE MOMENT—RESISTING SPACE FRAMES—Sec. 91.2622	235
DUMBWAITERS—Sec. 91.1705,	
4305(d)	118, 397
DWELLINGS, MASONRY—	
Sec. 91.4814.1	395-397
DWELLINGS, WOOD FRAME (R-1)—	
(see HOUSING REQUIREMENTS)	

— E —

EARTH BEARING CAPACITY—Div. 28	247
EARTH PRESSURE, retaining wall,	
Sec. 91.2809	256
EARTHQUAKES (see DESIGN or Div. 23)	
EGRESS (see EXITS)	
ELECTRIC WELDING (see WELDING)	
ELEVATED TANKS—Sec. 91.2305	134-145
ELEVATOR SHAFTS	
Dumbwaiter—Sec. 91.1705,	
4305(d)	118, 339
General—Sec. 91.1703,	
1705(a)	117, 118
Vestibules—Sec. 91.1801(d)	130
EMERGENCY EXIT WAY ILLUMINATION—Sec. 91.3310	302
ENCLOSURES	
Dumbwaiter—Sec. 91.1705,	
4305(d)	118, 339
Floor openings—Sec. 91.1703(b)	117
Shaft—Sec. 91.1703(b), 1705(a)	118
Stair—Sec. 91.1703(b),	
3305	118, 296-299
ENERGY INSULATION (see CALIFORNIA ADM. CODE, TITLE 25)	
Sec. 91.0403.1(e)	181
Fees—Sec. 91.0204, Table	
No. 2-A	22, 23
Inspection—Sec. 91.0309(b)	34
ENGINEERING (see DESIGN)	
ENGINEERING GEOLOGISTS	
Qualification Board—	
Sec. 91.0304.3	32
ENTRY, Right of—Sec. 91.0302	23
ERECTION (see CONCRETE STEEL, etc.)	
EXCAVATION IN HILLSIDE AREAS (see GRADING, EXCAVATIONS AND FILLS)	
EXCAVATIONS (see GRADING, FOOTINGS AND FOUNDATIONS)—	
Sec. 91.2801(b)	248
Exempted from Code—	
Sec. 91.0101(a)	13

Subject — Section	PAGE
EXEMPTIONS	
Code does not apply—	
Sec. 91.0102(a)	13
Permit not required—Sec. 91.0201 ..	20
Plans not required—Sec. 91.0207 ..	25
EXHIBITS, BOOTHS (Exempted from Code—Sec. 91.0201(a))	20
EXISTING BUILDINGS—	
Sec. 91.0103, .0315	15-19, 41-43
Existing excavations and fills—	
Sec. 91.0103(n)	18
EXIT	
Defined—Sec. 91.0403(e)	47
General—Div. 33	289
Housing—Divs. 13,	
14, 33	101, 105, 289
Special (see GROUP A, B, etc.)	
EXPLOSIVES VAULTS	
Area—Sec. 91.4105(b)	324
Construction—Sec. 91.4105(d)	324
Doors—Sec. 91.4105(i)	325
Electrical—Sec. 91.4105(k)	325
Floors—Sec. 91.4105(e)	324
Heating—Sec. 91.4105(i)	325
Isolation—Sec. 91.4105(e)	324
Openings—Sec. 91.4105(h)	325
Roof—Sec. 91.4105(f)	324
Scope—Sec. 91.4105(a)	324
Ventilation—Sec. 91.4105(g)	324
Walls—Sec. 91.4105(d)	324
EXTERIOR OPENINGS (see OPENINGS)	
EXTERIOR WALLS (see WALLS)	

— F —

FABRICATION	
Wood—Sec. 91.2501(c)	177
FACING OF WALLS (see VENEER)	
Definition—Sec. 91.0403(f)	43
FEES	
Change of occupancy—	
Sec. 91.0315(b)	41
Duplicate certificate—	
Sec. 91.0315(c)	42
For expired permits—	
Sec. 91.0206(b)	24
Grading—Sec. 91.0209(a)	25
Investigation—Sec. 91.0204	22-23
Permit—Sec. 91.0204	22-23
Plan checking—Sec. 91.0209	25-26
Plan maintenance—Sec. 91.0204(g) ..	22
Registered Deputy Building	
Inspector—Sec. 91.0311(c)	39
FENCES	
Exempt from Code, when—	
Sec. 91.0102(b)	13-15
Group S occupancy—	
Sec. 91.0804(a)	79
Protection during construction—	
Sec. 91.4401(a), .4403(d)	349
Replacing glass exempt from—	
Sec. 91.0102(b)	13-15
Spite (see Los Angeles Municipal Code)	
FILLED GROUND (see GRADING)	
Making of—Sec. 91.2801(b)	248
Use of—Sec. 91.2802(b)	248
Use of for dwellings—	
Sec. 91.3012	375
FILM (see CELLULOSE-NITRATE PROCESSING ROOMS; FILM VAULTS and PROJECTION ROOM)	
FILM VAULTS	
Area—Sec. 91.4104	325
Construction—	
Sec. 91.4104(c), (d)	323

Subject — Section	PAGE	Subject — Section	PAGE
Doors—Sec. 91.4104(g)	324	Nonrated partitions—Sec. 91.1706	121
Electrical—Sec. 91.4104(i)	325	Occupancy separation—	
Heating—Sec. 91.4104(k)	325	Sec. 91.0503(d)	61
Location—Sec. 91.4104(e)	325	Openings, exterior—Sec. 91.1704	117
Openings—Sec. 91.4104(f)	325	Openings, exterior, protection—	
Scope—Sec. 91.4104(a)	323	Sec. 91.0504, .1604(c)	63, 114
Sprinkler—Sec. 91.4104(j)	325	Outdoor Advertising Structures—	
Ventilation—Sec. 91.4104(h)	325	Sec. 91.5208	439
FINISH-INTERIOR WALL AND		Parapet walls—Sec. 91.1703(a)	117
CEILING		Partitions—Sec. 91.1705,	
(Fire-Resistive Standards)		1706(b)	118-121, 121
Application—Sec. 91.4203	329	Prohibited vehicles—	
Classification—Sec. 91.4202(b)	329	Sec. 91.1608	115
General—Sec. 91.4201	329	Projections from buildings—	
Occupancy requirements—		Sec. 91.1603(f)	112
Sec. 91.4204	330	Provisional structures in Fire	
Testing materials—Sec. 91.4202(a)	329	District No. 1—Sec. 91.1605	114
FIRE CLAY FLUE LINING		Roof covering—Sec. 91.1603(h)	112
For dwellings—Sec. 91.4822(f)	401	Roofing, general—Sec. 91.3203(e)	288
In general—Sec. 91.3701,		Separation, occupancy—	
.3702	312, 312-313	Sec. 91.0503(d)	62
FIRE DAMAGE (see ALTERATIONS)		Sheds, construction—	
FIRE DEPARTMENT CONNECTIONS—		Sec. 91.1603(e)	112
Sec. 91.4501(a)	352	Sprinklers, basement—	
FIRE DISTRICTS		Sec. 91.1603(g)	112
Additions to buildings—		Show windows—Sec. 91.1706(f)	122
Sec. 91.1602	112	Sprinklers for area—	
Advertising Statuaries—		Sec. 91.0506(h)	64
Sec. 91.5208	439	Standpipes—Sec. 91.0511	71
Alterations in—Sec. 91.1603(a)	112	Standpipes, stage—	
Area of Type IV buildings in Fire		Sec. 91.3904(e)	317
District No. 1—Sec. 91.1604(b)	114	Temporary partitions—	
Areas of buildings, general—		Sec. 91.1706(b)	122
Sec. 91.0506	63-64	Trimwood—Sec. 91.1705(h),	
Basement sprinklers—		.1706(f)	122
Sec. 91.1603(g)	113	Type IV buildings in Fire District	
Boundaries, Fire Districts No. 1 and		No. 1—Sec. 91.1605(b)	112
2—Sec. 91.1601(a)	109	Type V buildings in Fire District	
Buildings overlapping in fire dis-		No. 2—Sec. 91.1606(b)	115
trict boundaries—Sec. 91.1601(c)	110	Types of buildings, general—	
Canopies—Sec. 91.1603(e)	112	Sec. 91.1705	118-121
Conforming buildings—		Types of buildings permitted—	
Sec. 91.1603(a)	112	Sec. 91.1604(a), .1606(a)	113, 115
Construction, general—		Walls, exterior—Sec. 91.1606(b),	
Sec. 91.1705	118-121	.1704, .1705	115, 117, 118
Construction sheds—		Walls, opening protection—	
Sec. 91.1603(e)	112	Sec. 91.0504(a), .1604(c)	63, 114
Definition of—Sec. 91.0403(f)	47	Walls, openings in—	
Doors, interior, wood—		Sec. 91.0504, .1604(c)	63, 114
Sec. 91.1706(f)	122	Walls, parapet—Sec. 91.1703(a),	
Dwellings in Fire District No. 2—		.3604(b)	117, 311
Sec. 91.1606	115	Windows, show—	
Exterior openings—Sec. 91.1704	117	Sec. 91.1706(f)	122
Exterior openings, protection of—		Windows, wood—Sec. 91.1706(f)	122
Sec. 91.0505(a), .1604(c)	63, 114	FIRE DOORS	
Exterior stairs, construction—		Air duct shutters—	
Sec. 91.4508	356	Sec. 91.4307(g)	345
Exterior walls, Type V—		Boiler room, general—	
Sec. 91.1606(b), .1702	115, 116	Sec. 91.0509(a)	70
Fire District No. 1—		Boiler room, Group S—	
Sec. 91.1601(a)	109	Sec. 91.0807(b)	83
Fire District No. 2—		Certificate for—	
Sec. 91.1601(b)	112	Sec. 91.4307(j)	346
Fire doors, exterior—		Classification of—	
Sec. 91.0505(a), .1604(c)	63, 114	Sec. 91.4307(c)	343-344
General requirements—		Division walls—Sec. 91.0506(i)	64
Sec. 91.1603	112-113	Enclosing shaft—Sec. 91.1703(b)	117
Location of buildings—		Exterior wall, general—	
Sec. 91.0504	62-63	Sec. 91.0504	62-63
Mezzanines—		Exterior wall, in fire district—	
Sec. 91.1706,		Sec. 91.1604(c)	114
.1707	121, 123	Explosives Vault—Sec. 91.4105(i)	325
Moving buildings—		Film vault—Sec. 91.4104(f)	324
Sec. 91.1603(d)	112	Fusible links—Sec. 91.4307(j)	346
Nonconformity buildings—		Glass in—Sec. 91.4307(j)	346
Sec. 91.1603(b)	112	In Fire District No. 1—	
		Sec. 91.1604	113-114

Subject — Section	PAGE	Subject — Section	PAGE
Installation of—Sec. 91.4307(j)	346	Suspended ceilings—	
Interconnection of—		Sec. 91.4705	361
Sec. 91.4307(j)	346	Types of buildings (see TYPE I, II, etc.)	
Labeling of—Sec. 91.4307(e)	345	Walls, separation—Sec. 91.0503	60-62
Projection room—Sec. 91.4003	319	Windows, fire—Sec. 91.4307	342-346
Self-closing, when—		Wood, fire rating—	
Sec. 91.4307(j)	346	Sec. 91.4303(g)	334
Separation wall openings—		FIRE SAFETY STANDARDS	
Sec. 91.0503, 4307(c)	61, 343-344	Existing Buildings—Sec. 91.0507	65
Shaft enclosure—Sec. 91.1703(b)	114	Existing Subgroup D-3 Occupancies—	
Vault, film and explosives—Div. 41	321	Sec. 91.0909	87
FIRE ESCAPES		FIRESTOPS	
Existing doors to—Sec. 91.3301	290	Dwellings—Sec. 91.4815	397-398
FIREPLACES —Sec. 91.3702(d),		Framing requirements—	
4823(e)	312, 405	Sec. 91.2507(b)	184
FIRE EXTINGUISHERS —		Roof spaces—Sec. 91.3201(b)	284
Sec. 91.0510	70	FIRE WINDOWS	
FIRE-RESISTIVE CONSTRUCTION		Boiler room—Sec. 91.0509(a)	70
Air duct shutters—		Required—Sec. 91.0504,	
Sec. 91.4307(g)	345	1604	62-63, 113-114
Areas (see TYPE I, II, III, etc.)		Types of—Sec. 91.4307	342-346
Automatic doors, general—		FIRE ZONES (see FIRE DISTRICTS)	
Sec. 91.4307(j)	346	FLAG POLES	
Boiler rooms—Sec. 91.0509(a)	70	Allowed—Sec. 91.1702(b)	116
Ceilings, fire ratings—		Height—Sec. 91.3601(c)	309
Sec. 91.4304, 4306	334, 339	Permits required—	
Ceilings, suspended—Sec. 91.4705	361	Sec. 91.0201(a)	20
Classes of openings—		FLAME CUTTING—AISC 1.23.2	245
Sec. 91.4307(c)	343-344	FLAMMABLE LIQUIDS (see	
Conduits and pipes—		HAZARDOUS MATERIALS)	
Sec. 91.2617(d),		Definition—Sec. 91.1005	89
4303(f)	231, 331	FLASHING (see HOUSING	
Doors, closing of—		CONSTRUCTION)	
Sec. 91.4370(j)	345	FLAT SLABS (see CONCRETE SLABS)	
Doors, fire—Sec. 91.4307	342-346	FLOOR	
Duct shutters—Sec. 91.4307(g)	345	Area allowed—Sec. 91.0506	63
Dwelling (see DWELLINGS)—		Asphalt—Sec. 91.4810(h)	379
Div. 48	373	Concrete on wood—	
Existing Group H occupancies—		Sec. 91.2308, 4810(h)	147, 379
Sec. 91.1302	105	Definitions of—Sec. 91.0403	45-51
Finish, walls and ceiling—Div. 42	329	Double required, when—	
Fireproofing—Sec. 91.4302, 4303	331	Sec. 91.4306	339
Fire windows—Sec. 91.4307(a)	342	Dwelling—Sec. 91.4809,	
Floors, fire ratings—		4810	376-379, 379-383
Sec. 91.4306	342	Enclosure under—Sec. 91.4928	425
Lath and plaster (see LATHING)—		Food establishment—	
Div. 47	358	Sec. 91.0508	65-70
Lumber, fire ratings—		Height above ground—	
Sec. 91.4303(g)	334	Sec. 91.4809(b)	376
Occupancy separation—		Laminated—Sec. 91.2514	191-193
Sec. 91.0503, 4307(c)	61, 343	Load reduction—Sec. 91.2803	248-251
Openings, fire protection—		Loads—Sec. 91.2802(e)	247
Sec. 91.4307	342-346	Masonry on wood—Sec. 91.2308,	
Partitions, fire ratings—		4810(h)	147, 379
Sec. 91.4305(e)	342	Mezzanine—Sec. 91.1706,	
Partitions, separation—		1707	121-123, 123
Sec. 91.0503	60-62	Opening enclosures—	
Plaster, types of—		Sec. 91.1703(b)	117
Sec. 91.4302, Div. 47	331, 358	Plank and girder—	
Prestressed concrete—		Sec. 91.4810(g)	381
Sec. 91.4301	331	Plywood—Sec. 91.4810(g)	381
Projection rooms (see PROJECTION		Projection room—Sec. 91.4001	319
ROOM)—Div. 40	319	Stago—Div. 39	316
Protection assemblies—		Steel joist—AISC 1.18	245
Sec. 91.4306	342	Title—Sec. 91.4810(h)	381
Protection, structural parts—		Vaults (firm and explosives)—	
Sec. 91.4304	334	Div. 41	321
Self-closing doors, general—		Ventilation under wood—	
Sec. 91.4307(j)	345	Sec. 91.4809	376-379
Shafts, dumbwaiter—		Wood joists—Sec. 91.4810	379-383
Sec. 91.4305(d)	339	FLUES (see CHIMNEYS)	
Shafts, general—Sec. 91.1705	118-121	FOOD ESTABLISHMENTS	
Shutters, air duct—		General requirements—	
Sec. 91.4307(q)	346	Sec. 91.0508	65-70
Steel lintels, fireproofing—		FOOTINGS AND FOUNDATIONS	
Sec. 91.1706(e)	121	General—Div. 28	247
Structural parts, fireproofing—		Dwellings—Sec. 91.4807	375-376
Sec. 91.1705, 4304	118-121, 334		

Subject — Section	PAGE	Subject — Section	PAGE
Effective date of Ordinance— Sec. 91.0102(a)	13	General requirements—Div. 5, Div. 48, Div. 49	58, 373, 407
Enforcement powers vested in Board of Building and Safety Sec. 91.0301	30	Special requirements—Div. 13	113
Existing excavations and fills— Sec. 91.0103(n)	18	GROUP J OCCUPANCIES Defined—Sec. 91.0502(j)	60
Extension of time may be granted—Sec. 91.0206(b)	24	General requirements—Div. 5	58
Fills in hillside areas— Sec. 91.0102(a), .0309(a)	13, 35	Special requirements—Div. 15	108
Grading permit—Sec. 91.0204(e)	23	GROUP R OCCUPANCIES Defined—Sec. 91.0502(i)	60
Grading permit fees— Sec. 91.0204(a)	23	General requirements—Div. 5, Div. 48, Div. 49	58, 373, 407
Inspection notice to be given— Sec. 91.0309(e), (f)	35	Special requirements—Div. 14	107
Map of hillside areas	456-457	GROUP S OCCUPANCIES Defined—Sec. 91.0502(c)	58
Notice to repair and reconstruct excavation and fill— Sec. 91.0103(n)	18	General requirements—Div. 8	78
Permit fees—Sec. 91.0204(e)	23	Nonrated partitions— Sec. 91.1706(b)	121
Permit required—Sec. 91.0102(a)	13	GROUT SPACES —Sec. 91.2413(c)	164
Permit required, hilly terrain— Sec. 91.0201(b)	20	GROUTED MASONRY —Sec. 91.2406	158
Plan checking fee for grading work—Sec. 91.0207(a), Sec. 91.0209(a)	24-25	GUARD RAILS Required—Sec. 91.4404	334
Plans and specifications not public records—Sec. 91.0211(f)	28	Strength of—Sec. 91.2307	146
Plans and specifications for grading required— Sec. 91.0201(c)	21	Special—Sec. 91.3305(i)	268
Responsibility of permittee— Sec. 91.0313	38	GUNITE Application of—Sec. 91.2621	233
Retaining walls and protective devices, maintenance of— Sec. 91.0103(m)	17	Fireproofing—Div. 43	331
GRANDSTANDS (see GROUP B)		Plaster—Sec. 91.4713	371
GRAVEL AND EXCAVATION STORAGE (Exempted from Code)— Sec. 91.0102(a)	13	Specifications for— Sec. 91.2621	233
GREENHOUSES Loads, Live—Sec. 91.2302(a)	132	GYMNASIUMS (see GROUP B)	
Roofs of—Sec. 91.3603(h)	310	GYPSUM Fire-resistive construction—Div. 43	331
GROUP A OCCUPANCIES Defined—Sec. 91.0502(a)	58	Lath—Div. 47	358
General requirements—Div. 5	58	Masonry—Sec. 91.2407	159-161
Special requirements—Div. 6	73	Plaster—Div. 47	358
Nonrated partitions— Sec. 91.1706(b)	121	Reinforced—Sec. 91.2407	159-161
GROUP B OCCUPANCIES Defined—Sec. 91.0502(b)	58	Wallboard—Sec. 91.4702, .4714	358-359, 371-372
General requirements—Div. 5	58		
Special requirements—Div. 7	75		
Nonrated partitions— Sec. 91.1706(b)	121		
GROUP D OCCUPANCIES Defined—Sec. 91.0502(d)	58		
General requirements—Div. 5	58		
Special requirements—Div. 5	58		
Temporary partitions— Sec. 91.1706(b)	121		
GROUP E OCCUPANCIES (see HAZARDOUS MATERIALS) Defined—Sec. 91.1001	88-89		
General requirements—Div. 10	88		
Special requirements—Div. 10	88		
GROUP F OCCUPANCIES Defined—Sec. 91.0502(f)	58		
General requirements—Div. 5	58		
Special requirements—Div. 11	101		
GROUP G OCCUPANCIES Defined—Sec. 91.0502(g)	60		
General requirements—Div. 5	58		
GROUP H OCCUPANCIES Defined—Sec. 91.0502(h)	60		
General Sec. 91.1301	103		

— H —

HALLWAYS (see EXITS)	
HAZARDOUS MATERIALS Exempted from Group E occupancy classifications— Sec. 91.1001(b)	88
Agricultural use of hazardous materials—Sec. 91.1001(b)	88
Cleaning establishments— Sec. 91.1001(b)	88
Equipment using hazardous materials—Sec. 91.1001(b)	88
Liquor store—Sec. 91.1001(b)	88
Special store—Sec. 91.1001(b)	88
Special rooms—Sec. 91.1001(b)	88
Paints—Sec. 91.1001(b)	88
Refrigeration systems— Sec. 91.1001(b)	88
General Requirements Group E Occupancies, Area, basic area— Sec. 91.1052(a)	94
Area, sprinklered— Sec. 91.1052(b)	94
Area, multi-story buildings— Sec. 91.1052(b)	94
Area, one-hour construction, Sec. 91.1052(c)	94
Basement—Sec. 91.1061(a)	94
Doors and locks—Sec. 91.1040(b)	92
Draft stops—Sec. 91.1061(c)	94
Ducts—Sec. 91.1067, .1069	96, 96-97
Electrical protection— Sec. 91.1070	97
Exterior walls—Sec. 91.1051	93
Exits, number required— Sec. 91.1040(a)	92

Subject — Section	PAGE	Subject — Section	PAGE
Exits through adjacent occupancies—Sec. 91.1040(c)	93	Explosive material, storage manufacture or processing—	
Openings, general—Sec. 91.1051	93	Sec. 91.1065(a)	95
Openings, conveyor—		Explosive material, ventilation—	
Sec. 91.1061(d)	94	Sec. 91.1071(c)	97
Separation, general—		Exterior walls—Sec. 91.1065(d)	95
Sec. 91.1030	92	Flammable dust, construction—	
Separation, storage area from use or processing area—		Sec. 91.1076(d)	99
Sec. 91.1035	92	Flammable dust, definition—	
Separation, Group G from E exempted—Sec. 91.1030	92	Sec. 91.1005	89
Tanks and vessels, protection of supporting members—		Flammable dust, dust collection system—Sec. 91.1076(c)	99
Sec. 91.1061(b)	94	Flammable dust, Group E-2 occupancy—Sec. 91.1020(b)	91
Ventilation, mechanical—		Flammable dust, special requirements—Sec. 91.1076	99
Sec. 91.1067	96	Flammable dust, ventilation—	
Ventilation, gravity—		Sec. 91.1076(d)	100
Sec. 91.1068	96	Flammable dust, ventilation of housing—Sec. 91.1065(b)	95
Special Requirements		Flammable fiber, construction—	
Group E-1 Occupancies, Definition—Sec. 91.1020(a)	91	Sec. 91.1077(b)	100
Fire-resistive construction—		Flammable fiber, definition—	
Sec. 91.1063	95	Sec. 91.1005	89
Number of exits—Sec. 91.1040(a) ..	92	Flammable fiber, Group E occupancy—Sec. 91.1020(c)	92
Sprinklered—Sec. 91.1063(a)	95	Flammable fiber, special requirements—Sec. 91.1077	100
Ventilation for flammable liquids—		Flammable gas, definition—	
Sec. 91.1073	98	Sec. 91.1005	89
Special Requirements		Flammable gas, Group E-1 occupancy—Sec. 91.1020(a)	91
Group E-2 Occupancies, Definition—Sec. 91.1020(b)	91	Flammable gas, Group E-2 occupancy—Sec. 91.1020(b)	91
Doors—Sec. 91.1040(b)	92	Flammable gas, special requirements—Sec. 91.1074	99
One-hour or incombustible construction omitted—		Flammable gas, ventilation—	
Sec. 91.1063(b)	95	Sec. 91.1074(b)	99
Unprotected wood members—		Flammable liquid, Class C or D regulated as Class B—	
Sec. 91.1061, .1063(b)	94, 95	Sec. 91.1010	91
Ventilation when housing flammable liquids—		Flammable liquid, definition	
Sec. 91.1073	98	Class A, B, C, D—	
Special Requirements		Sec. 91.1005	89
Group E-3 Occupancies, Definition—Sec. 91.1020(c)	92	Flammable liquid, floors—	
Doors—Sec. 91.1040(b)	92	Sec. 91.1073(b)	98
HAZARDOUS MATERIALS,		Flammable liquid, Group E-1 occupancy—Sec. 91.1020(a)	91
SPECIAL REQUIREMENTS		Flammable liquid, Group E-2 occupancy—Sec. 91.1020(b)	91
Combustible liquid, Class B flammable liquid—		Flammable liquid, Group E-3 occupancy—Sec. 91.1020(c)	92
Sec. 91.1010	91	Flammable liquid, regulated liquefied flammable gas—	
Combustible liquid, Class D flammable liquid—		Sec. 91.1010	91
Sec. 91.1010	91	Flammable liquid, special requirements—Sec. 91.1073	98
Combustible liquid, definition		Flammable liquid, ventilation—	
Sec. 91.1005	89	Sec. 91.1073(c)	98
Combustible liquid, floor—		Gravity ventilation—Sec. 91.1068	96
Sec. 91.1078(b)	100	Liquefied flammable gas, definition—Sec. 91.1005	90
Combustible liquid, Group E-3 occupancy—Sec. 91.1020(c)	92	Liquefied flammable gas, Group E-1 occupancy—	
Combustible liquid, liquefied flammable gas—		Sec. 91.1020(a)	91
Sec. 91.1010	91	Liquefied flammable gas, Group E-2 occupancy—	
Combustible liquid, special requirements—Sec. 91.1078	100	Sec. 91.1020(b)	91
Dangerous chemical (see UNSTABLE MATERIAL)		Liquefied flammable gas, special requirements—Sec. 91.1075(a)	99
definition—Sec. 91.1005	89	Liquefied flammable gas, ventilation—Sec. 91.1075(b)	99
Electrical protection—		Mechanical ventilation—	
Sec. 91.1070	97	Sec. 91.1067	96
Explosive material, definition—		Tank and vessel construction—	
Sec. 91.1005	89	Sec. 91.1065(c)	95
Explosive material, exemption from E-1 occupancy—		Unstable material, definition—	
Sec. 91.1063(a)	95	Sec. 91.1005	91
Explosive material, general requirements—Sec. 91.1071	97-98		
Explosive material, Group E-1 occupancy—Sec. 91.1020(a)	91		

Subject — Section	PAGE	Subject — Section	PAGE
Unstable material, Group E-1 occupancy—Sec. 91.1020(a)	91	Design—Sec. 91.2307(e)	146, 147
Unstable material, Group E-2 occupancy—Sec. 91.1020(b)	91	HELISTOP	
Unstable material, liquid material—Sec. 91.1072(b)	98	Definition—Sec. 91.0503(f)	58
Unstable material, solids— Sec. 91.1072(d)	98	Legal provisions—Sec. 91.1712	129
HAZARDOUS MATERIALS ROOMS (see SPRAY ROOMS, FILM VAULTS, EXPLOSIVES VAULTS AND MOTION PICTURE LABORATORIES AND CUTTING ROOMS)		Design—Sec. 91.2307(e)	146, 147
Area—Sec. 91.4102(c)	321	HILLSIDE (see GRADING AND EXCAVATION)	
Classification—Sec. 91.4101(a)	321	HOLLOW UNIT MASONRY— Sec. 91.2415	166-167
Construction—Sec. 91.4102(f)	321	HORIZONTAL FORCE	
Doors—Sec. 91.4102(c)	321	Definition—Sec. 91.2301	131-132
Electrical—Sec. 91.4102(i)	322	Designing for (see DESIGN)— Sec. 91.2305	134-145
Exits—Sec. 91.4102(d)	321	HORIZONTAL MEMBERS, WOOD	
Floors—Sec. 91.4102(i), (j)	322	Blocking and bridging (Lateral Support)—Sec. 91.2506(g)	182
Location—Sec. 91.4102(i), (j)	322	Sec. 91.2506(g)	183
Openings—Sec. 4102(g), (h)	321	Embedment—Sec. 91.2517(c)6	195
Separation—Sec. 4102(b)	321	End bearing—Sec. 91.2506(f)	182
Ventilation—Sec. 91.4102(k)	322	Flexure—Sec. 91.2506(b)	181
Walls—Sec. 91.4102(f)	321	Horizontal shear— Sec. 91.2506(c), (d)	181
HEATING (see also GROUP A, B, etc.)		Mechanically laminated floors and roofs—Sec. 91.2517(i)	182
Appliances gas, housing— Sec. 91.4921, 4922, 422-423, 423-424		Ties—Sec. 91.2516(c)	194
Appliances, gas, general— Sec. 91.3701, .3707,	312, 315, 423-424	HOSPITALS (see GROUP D)— Sec. 91.0502(d)	58-59
Boiler room, definition— Sec. 91.0403(b)	46	HOTELS (see GROUP H)— Sec. 91.0502(h)	60
Boiler rooms, general— Sec. 91.0509, .0510	70	HOTPLATES—Sec. 91.4930.1	426-427
Chimneys—Sec. 91.3702,	312-313, 401-404	HOUSE MOVING—(see Relocation Permit)	
Chimneys, terra cotta— Sec. 91.3703	313	HOUSES OF CORRECTION (see GROUP D)—Sec. 91.0502(d)	58-59
Chimneys, terra cotta— dwellings—Sec. 91.3702(a)	312	HOUSING ADVISORY AND APPEAL BOARD—Sec. 91.0304.1	30-31
Drying rooms—Sec. 91.3702(d), .4823	313, 404-405	HOUSING CONSTRUCTION	
Fireplaces—Sec. 91.3702(d), .4823	313, 404-405	Accessory buildings, construction—Div. 48	373
Fireplaces, false— Sec. 91.4823	404-405	Accessory buildings, on slabs— Sec. 91.4807(h)	376
Gas heating appliances, dwelling— Sec. 91.4822, .4921	401, 422	Accessory buildings, roofing— Sec. 91.4813	385-393
Gas appliances, general— Sec. 91.3701, .3707	313, 315	Bearing walls, stud— Sec. 91.4814(c)	394
Gas boilers—Sec. 91.0509, .0510	70	Basement walls— Sec. 91.4809(g)	379
Gas shutoff Groups A and S— Sec. 91.0607, .0807(c)	74, 82	Blocking joist—Sec. 91.4801(d)	373
Incinerators, construction— Sec. 91.3706(b)	314	Bolting of sills—Sec. 91.4809(c)	376
Incinerators, exempt, when— Sec. 91.0102(a)	13	Bracing—Sec. 91.4809, .4817	376-379, 398-399
Incinerators, separation of— Sec. 91.0509(b)	70	Brickwork for—Sec. 91.4806(b)	374
Metal smokestacks— Sec. 91.3701, .3704	312, 313	Ceiling joists—Sec. 91.4811(a)	383
Smokepipes—Sec. 91.3701, .3705	312, 313	Certificate of occupancy— Sec. 91.0315(a)	41
Terra cotta chimneys— Sec. 91.3703	313	Chimneys—Sec. 91.4822, .4823	401-404, 404-405
Terra cotta chimneys, dwelling— Sec. 91.3702(a)	312	Chimneys, false— Sec. 91.4822(j)	403
Venting required, when— Sec. 97.3701(b), .3707	312, 315	Comply with Div. 48— Sec. 91.4801(a)	373
Warm air furnaces, housing— Sec. 91.4921	422	Composition roofing— Sec. 91.4813	385-393
HEAVY TIMBER AS FIRE RESISTIVE CONSTRUCTION Sec. 91.4303(g)	331	Concrete floors— Sec. 91.4807, .4810(h)	375, 382
HELIPORT		Concrete floors, wood— Sec. 91.4810(h)	382
Definition—Sec. 91.0502(f)	58	Concrete mix—Sec. 91.4806(d)	375
Legal provisions—Sec. 91.1712	129	Cutting or boring, joists— Sec. 91.4810(f)	381
		Cutting or boring studs— Sec. 91.4818	399-400
		Drainage of roofs—Sec. 91.4812(e)	385
		False mantels—Sec. 91.4824(b)	405
		Fences—Sec. 91.0102(e)	13

Subject — Section	PAGE
Fireplaces, masonry—	
Sec. 91.4823	404
Firestopping—Sec. 91.4815	397
Flashing—Sec. 91.4813(h)	392
Floor joists—Sec. 91.4801(b)	373
Flooring, sub—Sec. 91.4810(g)	381
Floors—Sec. 91.4810	379-383
Floors, concrete or masonry—	
Sec. 91.4807, 4810(h) 375-376, 382	
Floors, height above ground	
Sec. 91.4809(b)	376
Floors, masonry on wood—	
Sec. 91.4810(h)	382
Flues (see also VENTS)—	
Sec. 91.4822(f)	403
Footings—Sec. 91.4807(g),	
4810(h)	376, 382
Footings, bolting to—	
Sec. 91.4809(c)	378
Footings, plates—	
Sec. 91.4806, 4809(c)	373, 378
Footings, slabs in lieu of—	
Sec. 91.4807, 4810(h) 375-376, 382	
Foundations (see FOOTINGS	
AND FOUNDATIONS)	
Framing—Sec. 91.4810, 4811, 4812,	
4814	379-383, 383, 393-394
Girders—Sec. 91.4810(a)	379
Girders, posts under—	
Sec. 91.4809(a)	376
Greenhouses—Sec. 91.3603(h)	311
Header joist—Sec. 91.4810(c)	379
Headers over openings—	
Sec. 91.4816	398
Inspection of—Sec. 91.4801	373
Joists, floor construction—	
Sec. 91.4810	379-383
Lath houses—Sec. 91.0102(a)	13
Lathing exterior—	
Sec. 91.4819(b)	400
Lathing interior—	
Sec. 91.4820	401
Lintels—Sec. 91.4816	398
Lot survey—Sec. 91.0207,	
0309(c)	24-25, 34
Lumber, decay resistant—	
Sec. 91.4806(a)	373-374
Lumber, grades of—	
Sec. 91.4806(a)	373-374
Mantels, false—Sec. 91.4823	404-405
Mantels, masonry—	
Sec. 91.4823	404-405
Masonry floors—	
Sec. 91.4806, 4810(h) 373-375, 382	
Masonry floors on wood—	
Sec. 91.4810(h)	382
Masonry veneer—	
Sec. 91.4813, 4819(c) 385-393, 400	
Mix, concrete—Sec. 91.4806(d)	375
Mixed occupancy separation—	
Sec. 91.0503	60
Mortar—Sec. 91.4806(c)	375
Mudalls—Sec. 91.4806,	
4809(c)	373-375, 378
Nailing—Sec. 91.4808	376
Nonbearing partitions—	
Sec. 91.4814	393
Occupancy separation—	
Sec. 91.0503	60
Overflow scuppers—	
Sec. 91.4812(e)	385
Pergola—Sec. 91.0102(a)	13
Permits—Sec. 91.0201,	
0204	20-21, 22-23
Plastering, exterior—	
Sec. 91.4819(b)	400
Plastering, interior—	
Sec. 91.4820	401

Subject — Section	PAGE
Plastering, garages—Div. 14	107
Plans and specifications (see	
PLANS AND SPECIFICATIONS)	
Plates, cutting of—	
Sec. 91.4822(k)	404
Plates, footing—	
Sec. 91.4806, 4809(c) 373-375, 378	
Plates, studding—Sec. 91.4814	393
Plumbing access—Sec. 91.4919(b)	422
Plumbing required—	
Sec. 91.4908, 4919(c)	416, 422
Plywood sheathing, floor—	
Sec. 91.4810(g)	381
Plywood sheathing, roof—	
Sec. 91.4812(f)	385
Plywood sheathing, wall—	
Sec. 91.4817(b)	398
Posts under girders—	
Sec. 91.4809(d)	378
Pressure-treated lumber—	
Sec. 91.4806	373-375
Rafters—Sec. 91.4812	383-385
Redwood and cedar—	
Sec. 91.4806	373-375
Retaining walls, general—	
Sec. 91.2309	147
Roof flashing—Sec. 91.4813(h)	385
Roofing—Sec. 91.4813	385-393
Scuppers, roof overflow—	
Sec. 91.4812(e)	385
Sheathing, exterior walls—	
Sec. 91.4813, 4819 385-393, 400-401	
Sheathing floor—	
Sec. 91.4810(g)	381
Sheathing, roof boards—	
Sec. 91.4810(g)	381
Sheathing, roof plywood—	
Sec. 91.4812(f)	385
Shingles, wood or asphalt—	
Sec. 91.4813	385-393
Siding—Sec. 91.4813,	
4819	385-393, 400-401
Sills, footing—Sec. 91.4806,	
4809(c)	373-375, 378
Stucco (see PLASTERING)	
Studs—Sec. 91.4814,	
4816(d)	393, 398
Studs, bracing of—	
Sec. 91.4809(a), 4817 378, 398-399	
Studs, bracing of, underfloor—	
Sec. 91.4809(e)	378
Studs, cutting or boring—	
Sec. 91.4818	399-400
Subflooring—Sec. 91.4810(g)	381
Tail joists—Sec. 91.4810(c)	379
Tile roofing—Sec. 91.4813(g)	392
Toilet required—Sec. 91.4908	418
Treated lumber—	
Sec. 91.4806, 4809(f) 373-375, 379	
Underfloor construction—Sec.	
91.4806, 4809	373-375, 376-379
Veneer, masonry—	
Sec. 91.4813, 4819(c)	385-393, 400
Ventilation, underfloor—	
Sec. 91.4809	376-379
Walls—Sec. 91.4814	393
Walls, bracing of—Sec. 91.4809,	
4817	376-379, 398-399
Walls, stud—Sec. 91.4814,	
4816(d)	393, 398
Walls, weatherproofing—	
Sec. 91.4813	385-393
Water heaters—Sec. 91.4921	422
Weatherproofing—Sec. 91.4813 385-393	
Western red cedar—	
Sec. 91.4806, 4809(f) 373-375, 379	
Wood, grades of—	
Sec. 91.4806(a)	373-374

Subject — Section	PAGE
Wood, separation from earth— Sec. 91.4809(f)	379
HOUSING REQUIREMENTS	
Basement and cellars— Sec. 91.4927	425
Construction, Div. 48 and— Sec. 91.4903	373, 412-413
Courts—Sec. 91.4904(b), 4914	415, 422
Definitions—Sec. 91.4902	408-412
Electrical—Sec. 91.4920	422
Exits—Div. 33	289
Fire protection— Sec. 91.4922, 4926	423, 424
Garages—Sec. 91.4932	429
General—Sec. 91.4901	407
Heating and ventilating— Sec. 91.4921	422-423
Hotplates—Sec. 91.4930.1	426-427
Light and ventilation— Sec. 91.4912	421
Maintenance—Sec. 91.4931	428-429
Plumbing—Sec. 91.4919	422
Room areas—Sec. 91.4905, 4906, 4907	417-418
Sanitation—Sec. 91.4908, 4909, 4910	418-419
Stairs—Sec. 91.3305	296
Standpipes—Sec. 91.4925, 4926	424
Yards and courts—Sec. 91.4904	415

— I —

INCINERATORS	
Chimneys for—Sec. 91.3702	312-313
Construction of— Sec. 91.3706	314-315
Exempt from Code— Sec. 91.0102 (a)	13
Separation required— Sec. 91.0509(b)	70
INCOMBUSTIBLE	
Definition of— Sec. 91.0403(i)	48
INFLAMMABLE (see HAZARDOUS MATERIALS)	
INNER COURT WALLS	
Sec. 91.1703(c), .1705	117, 118-121
INSPECTION	
Alterations to plans— Sec. 91.0211(d)	27
Authority of Department— Sec. 91.0301	30
Authority to condemn— Sec. 91.0308	32
Called, dwelling— Sec. 91.4801	373
Called, general—Sec. 91.0309(b)	34
Certificate required, regular— Sec. 91.0314	41
Certificate required, special— Sec. 91.0311(b)	39
Change of occupancy— Sec. 91.0103, 0315	15-19, 41-43
Code does not apply— Sec. 91.0102(a)	13
Code, purpose of—Sec. 91.0103	15-19
Compliance, report of— Sec. 91.0311(b), 0314	39, 41
Concealing of work— Sec. 91.0306	32
Condemnation—Sec. 91.0308	32
Conflicting provisions— Sec. 91.0102(a)	13

Subject — Section		PAGE
Continuous—Sec. 91.0309, .0310	34-35, 36-38	
Continuous at plants— Sec. 91.2601	203	
Deputy inspector duties— Sec. 91.0311(b)	39	
Deputy inspector required— Sec. 91.0309, .0310	34-35, 36-38	
Double fees—Sec. 91.0204	22-23	
Emergency inspectors— Sec. 91.0301(f)	37	
Exemptions from Code— Sec. 91.0102(a)	13	
Exemptions from Permits— Sec. 91.0201	20-21	
Expiration of permits— Sec. 91.0206(b)	24	
Final—Sec. 91.0309(b), .0314	34, 41	
Fire door—Sec. 91.4307(a)	342	
Floor-loading notices— Sec. 91.2302(d)	131	
Grades, official—Sec. 91.0202(c)	21	
Interference with inspector— Sec. 91.0302	30	
Loading notices, floor— Sec. 91.2302(d)	129	
Lot survey—Sec. 91.0207, .0309(c)	24-25, 34	
Notices (see NOTICES)		
Permits cards—Sec. 91.0205	23	
Permit must be followed— Sec. 91.0313	41	
Permit not required— Sec. 91.0102, .0201	13-15, 20-21	
Permit required— Sec. 91.0201, .0203	20-21, 21	
Permit, revocation of— Sec. 91.0206	24	
Permits, expiration of— Sec. 91.0206(b)	24	
Permittee responsible— Sec. 91.0313	41	
Plans on Job—Sec. 91.0211(e)	27	
Plans, plat—Sec. 91.0207(a), .0309(c)	25, 34	
Purpose of Code—Sec. 91.0103	15-19	
Registered deputy— Sec. 91.0309, .0310	34-35, 36-38	
Registered deputy duties— Sec. 91.0311(b), .0314	39-41	
Report of compliance— Sec. 91.0311, .0314	38-40, 41	
Scope of Code—Sec. 91.0102	13	
Site plat—Sec. 91.0207, .0309(c)	25, 35	
Stopping use—Sec. 91.0307	32	
Stopping work—Sec. 91.0305	32	
Work, concealing of— Sec. 91.0306	32	
Wood—Sec. 91.2501(b)	178	
INSULATING MATERIAL—		
Sound—Sec. 91.4903(h)	414	
Thermal (see ENERGY INSULATION)		
INTERIOR TRIM—		
Sec. 91.1703, .1705(f)	117, 122	
IRON (see STEEL and IRON)		
ISOLATED BUILDINGS—		
Sec. 91.0102(a)	13	

— J —

JOIST ANCHORS—Sec. 91.2306(b)	145
JOIST HANGERS, dwelling— Sec. 91.4810(c)	379
JOISTS	
Concrete—Sec. 91.2608.8	230
Fire protection—Sec. 91.4306	339
Wood—Sec. 91.4810(b)	379

Subject — Section

PAGE

— K —

KITCHENS (see also GROUP A, B, etc.)	
Definition of—Sec. 91.0403(k)	48
Dwelling—Div. 49	407
Food establishment—Sec. 91.0508.65-70	

— L —

LABORATORIES (see TEST)

LADDERS

Boiler room exit—Sec. 91.3314(a)	304
Incinerator room exit—	
Sec. 91.3314(a)	304
To roof—Sec. 91.3305(k)	268

LAITANCE

Definition of—Sec. 91.2605.1	228
Removal of—Sec. 91.2605.1	228

LAMINATED WOOD AS FIRE

RESISTIVE CONSTRUCTION

Partitions—Sec. 91.4303	331
-------------------------	-----

LANDINGS, STAIRS (see STAIRS)

General—Div. 33	289
Dwellings and Group A—	
Sec. 91.3305(e), .4916(g)	296, 421

LATERAL BRACING—Sec. 91.2306.145-146
(see ROOF TRUSSES)

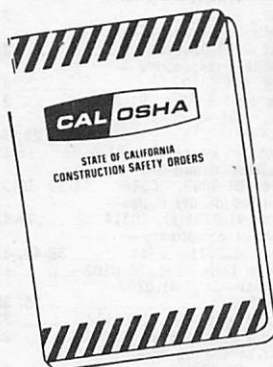
LATHING AND PLASTERING

Ceilings, suspended and furred—	
Sec. 91.4705	361
Fire-resistive—Sec. 91.4701(a),	
.4703	358, 359
Inspection—Sec. 91.4701(b)	358
Materials—Sec. 91.4701(a),	
.4702	358

Subject — Section

PAGE

Testing—Sec. 91.4701(c)	358
Lathing, interior	
Sec. 91.4703	359
Application—	
Sec. 91.4703	359
Corner reinforcement—	
Sec. 91.4703	359
Gypsum lath—	
Sec. 91.4703	359
Metal lath—	
Sec. 91.4703	359
Partitions, interior, hollow—	
Sec. 91.4704	360
Partitions, solid with studs—	
Sec. 91.4704(b)	360
Partitions, solid studless—	
Sec. 91.4704(c)	360
Plastering, exterior additional lath—	
Application—Sec. 91.4712(c)	371
Sec. 91.4711(e)	364
Backing—Sec. 91.4711(b)	364
Definitions—Sec. 91.4711(e)	364
Metal reinforcement—	
Sec. 91.4711(d)	364
Plasticity Agents—	
Sec. 91.4712(b)	369
Type—Sec. 91.4712(a)	369
Weather protection—	
Sec. 91.4711(b)	364
Plastering interior,	
Machine applied—Sec. 91.4709	363
Pneumatically placed plaster—	
Sec. 91.4713	371
Staff—Sec. 91.4710	364
LATH HOUSES (Exemption from	
Code)—Sec. 91.0102(a)	13



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Subject — Section	PAGE	Subject — Section	PAGE
LIBRARIES (see OCCUPANCY CLASS)—Sec. 91.050258-60			
LIGHT (see GROUP A, B, etc.)			
Exit—Sec. 91.3310(a)	302	— M —	
Skylight—Sec. 91.3603	309		
LIME		MAINTENANCE	
For mortar—Sec. 91.2403(p)	152	Adjustable bracing system—	
For plaster—Sec. 91.4702,		Sec. 91.0103(c)	16
Table 47-H	358, 368	Deteriorated buildings—	
LINING		Sec. 91.0103(a)	15
Chimney, for dwellings—		Protective devices, hillside—	
Sec. 91.4822	401-444	Sec. 91.0103(m)	18
Chimney, general—		Parapet—Sec. 91.0103(b)	16
Sec. 91.3701, 3702	312	Housing—Sec. 91.4931	428
Fireplace—Sec. 91.3702,		Repairs—Sec. 91.0103,	
4823	312, 404	1603(b)	15-19, 111
Incinerator—Sec. 91.3706	314	Scope of Code—Sec. 91.0102	13-15
LINTEL		Unsafe—Sec. 91.0103	15-19
Steel not fireproofed, when—		MALLS	
Sec. 91.1705(e)	121	Definition—Sec. 91.0403(m)	48
Wood for dwellings—		Door types—Sec. 91.3303(e), Ex. 3	294
Sec. 91.4816	398	Exit corridors—Sec. 91.3304	295
LIQUIDS (see FLAMMABLE LIQUIDS)		Exits—Sec. 91.3322, Table No. 33-A	308
LIQUID FUEL POWERED MOTOR GENERATOR ROOM—		Luminous ceilings—Sec. 91.1706(f)	122
Sec. 91.4112	328	Plastics, use of—Sec. 91.1705(d)	120
LIQUID PETROLEUM GAS CYLINDER STORAGE ROOM (see HAZARDOUS MATERIALS)		Separation from kitchens—	
LIVE LOADS (see DESIGN)		Sec. 91.0509	70
LOADING CANOPY		Sprinklers—Sec. 91.1705(d)	120
Allowed in fire districts—		Type construction—Sec. 91.1705(d)	120
Sec. 91.1603(e)	112	MARQUEES	
Area to be included—		Construction—Sec. 91.4509(d)	356
Sec. 91.4506(a)	355	Definition—Sec. 91.4501	352
Incombustible required—		Design—Sec. 91.2307	146
Sec. 91.4506(c)	355	General requirements—	
LOADING PLATFORMS—		Sec. 91.4509	356
Sec. 91.1603(i)	112	Signs on—Sec. 91.5207(a)	439
LOADS, DEAD (see DESIGN)		MASONRY (see CONCRETE)	
LOADS, LATERAL (see DESIGN)—		A.S.T.M. requirements—	
Sec. 91.2305, 2306, 134-138, 145-146		Sec. 91.2403	151-155
LOADS, LIVE (see DESIGN)		Bearing walls—Sec. 91.2418	173-174
Posting notice of—		Blocks (see CONCRETE, ADOBE, GLASS)	
Sec. 91.2302(d)	132	Bolts (see ANCHOR BOLTS)	
LOBBIES		Cavity wall masonry—	
Group A occupancies—Div. 6	73	Sec. 91.2410	162
Group B occupancies—Div. 7	75	Columns—Sec. 91.2420	175
LOT		Definitions—Sec. 91.2402	151
Building line definition—		Design—Sec. 91.2417	167
Sec. 91.0403(b)	46	Dwellings—Div. 48 and	
Line, imaginary—		Div. 49	373, 407
Sec. 91.0504(d)	62	Foundation—Sec. 91.2416(d)	167
Location on, dwellings—		Flexural computation—	
Sec. 91.4904	415	Sec. 91.2417(r)	170
Location on, general—		Flexural design—Sec. 91.2417(q)	170
Sec. 91.0504, 1704	62, 117	General construction	
Location on, over one building—		requirements—Sec. 91.2416	167
Sec. 91.0504(d)	62	General design—Sec. 91.2417	167-173
Property line definition—		Glass masonry—Sec. 91.2408	162
Sec. 91.0403(p)	49	Gypsum masonry—Sec. 91.2406	158
Site plat of—Sec. 91.0207	25	Materials and quality—	
Survey required, when—		Sec. 91.2403	151-155
Sec. 91.0309(c)	34	Minimum bar spacing—	
Two or more buildings on—		Sec. 91.2416(e)	167
Sec. 91.0505(d)	63	Nonbearing walls—Sec. 91.2419	175
LUMBER		Plain hollow unit masonry—	
Grade—Sec. 91.2505(a)	181	Sec. 91.2411	162
Marking—Sec. 91.2505(b)	172	Plain grouted masonry—	
Remanufacturing—Sec. 91.2505(d)	181	Sec. 91.2413	164
Sizes—Sec. 91.2503	180	Plain solid masonry—	
Stresses—Sec. 91.2504	180	Sec. 91.2412	163
		Protection of reinforcement—	
		Sec. 91.2416(g)	167
		Reinforced grouted masonry—	
		Sec. 91.2414	166
		Reinforced gypsum—	
		Sec. 91.2407	159
		Reinforced hollow unit	
		masonry—Sec. 91.2415	166

Subject — Section	PAGE
Shear and diagonal tension— Sec. 91.2417(s)	167
Splices in reinforcement— Sec. 91.2416(f)	167
Stack bond—Sec. 91.2417(c)	167
Stone masonry—Sec. 91.2409	162
Stresses—Sec. 91.2403(c)	152
Unreinforced table 24-G	163
Reinforced table 24-H	165
Symbols and notations— Sec. 91.2417(p)	170
Tests of—Sec. 91.2404	155
Unburned clay—Sec. 91.2405	157
Working stresses (see GENERAL DESIGN)	
MASONRY VENEER—Sec. 91.2901	258
MASTS, WIRELESS (Exempted from Code)—Sec. 91.0102(a)	13
MATERIALS, APPROVAL OF— Sec. 91.0303, .0309.1	30, 35
MECHANICAL VENTILATION (see VENTILATION)	
METAL BUILDINGS (see TYPE IV BUILDINGS)	
METAL LATH (see LATHING AND PLASTERING)	
METAL REINFORCING (see CONCRETE)	
METER SPACES—Sec. 91.4920(c)	422
MEZZANINES Balcony definition— Sec. 91.0403(b)	46
Requirements for— Sec. 91.1707	123
Wood allowed—Sec. 91.1706(f)	122
MINING (Exempted from Code)— Sec. 91.0102(a)	13
MIXED OCCUPANCY SEPARATION— Sec. 91.0503	60
MORTAR General—Sec. 91.2403(q)	153
Grout—Sec. 91.2403(r)	153
Grouted masonry— Sec. 91.2413	164-165
Gypsum masonry—Sec. 91.2406	158
Limitations—Sec. 91.2403(q)	153
Masonry (see MASONRY)	
Plaster (see LATHING AND PLASTERING)	
Proportions—Table 24-A	154
MOTION PICTURE LABORATORIES (see CELLULOSE-NITRATE FILM-PROCESSING ROOMS)	
MOTION PICTURE BOOTHS (see PROJECTION ROOMS)	
MOTION PICTURE SETS (exempted from Code)— Sec. 91.0102(a)	13
MOTION PICTURE THEATERS (see GROUP A, B OCCUPANCIES)	
MOVING OF BUILDINGS (see RELOCATION, DIV. 54)	
In fire districts— Sec. 91.0103(g), .1603(d)	17, 112
Inspection required before— Sec. 91.0103, .0310(e)	15-19, 36
Into city—Sec. 91.0103	15-19
Into fire districts— Sec. 91.0103, .1603(d)	15-19, 112
Out of fire districts— Sec. 91.0103(g)	17
MUDSILLS—Sec. 91.1708(b), .4807(h)	124, 376

— N —

NAILING Requirements—Sec. 91.4808	376
--	-----

Subject — Section	PAGE
NAILS Gypsum lath—Sec. 91.4703	359
Installation—Sec. 91.2510(f)	186
Metal lath—Sec. 91.4703	360
Metal side plates— Sec. 91.2510(f)	186
Number for connections— Sec. 91.4808, Table 48-C.276, 365	
Toe-nails—Sec. 91.2510(f)	186
Wood connections—Sec. 91.4808	376
Wood lath—Sec. 91.4703	359
Working loads—Sec. 91.2510(f)	186
NEW MATERIALS OR METHODS— Sec. 91.0303	30

NOTICE

Grading adjacent property owner— Sec. 91.0103(i)	17
Inspection, dwelling— Sec. 91.4801(c)	376
Inspection, general— Sec. 91.0309(b)	34
Loading—Sec. 91.2302(d)	133
Of condemnation—Sec. 91.0308	32
Of permit revocation— Sec. 91.0206(a)	24
To expose work—Sec. 91.0306	32
To stop use or occupancy— Sec. 91.0307	32
To stop work—Sec. 91.0305	32
NURSERIES (see GROUP D and GROUP H OCCUPANCIES)— Sec. 91.0502(d)	58

— O —

OCCUPANCY, GENERAL (see GROUP A, B, D, etc.)	
Certificate of—Sec. 91.0103, .0315	15-19, 41-43
Change of—Sec. 91.0103(e), .0315	16, 41-43
Classified by Superintendent— Sec. 91.0501	58
Definition of—Sec. 91.0502	58-60
Mixed—Sec. 91.0501, .0503	58-62
Separations required— Sec. 91.0503(b)	61
OIL DERRICKS (Exempted from Code)—Sec. 91.0102(a)	13
Separation of—Sec. 91.0504(g)	62
OPENINGS (see TYPES I, II, III, etc.)	
Communicating—Sec. 91.0503	61
Exterior, general— Sec. 91.0504(a), .1704	62, 117
Exterior, Fire District No. 1— Sec. 91.1604	113
Exterior, glazing—Sec. 91.1711	126
Fire protection of— Sec. 91.4307	342-346
In floors (stair, etc.)— Sec. 91.1703(b)	117
Openings in separation walls— Sec. 91.0503(c)	61
OUTDOOR ADVERTISING STATUARY— Sec. 91.5209	440
OUTSIDE STAIRWAYS General—Sec. 91.3305(a)	296
Dwellings and Group H— Sec. 91.4916(a)	421
OVERLOADING PROHIBITED— Sec. 91.0103, .0307	15-19, 32
OWNER'S CONSENT To obtain permit—Sec. 91.0203.1	22
OWNER'S RESPONSIBILITY— Permits—Sec. 91.0211(a)	27

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Subject — Section	PAGE
— P —	
PAD DRAINAGE (see SITE DRAINAGE)	
PAINTING (Exempted from Code)— Sec. 91.0102(a)	13
PAINT	
Storage—Sec. 91.1020(c)	92
Retail (exempted from Group E occupancy)—Sec. 91.1001(b)	88
PANIC HARDWARE (see GROUP A, B, etc.)	
Definition and length of— Sec. 91.0403(p)	49
PAPERING (exempted from Code)— Sec. 91.0102(a)	13
PARAPET WALLS	
Earthquake precautions— Sec. 91.0103(b)	16
General—Sec. 91.1703, .4404	117, 349
Maintenance—Sec. 91.0103(a)	15
In lieu of guard rails— Sec. 91.4404	349
PARKING LOT STRUCTURES — Sec. 91.1605(g)	114
PARTITIONS	
Anchorage of masonry— Sec. 91.2412(c), .2417(g), .2419, Div. 23	131, 163, 168, 175
Combustible finish on— Sec. 91.1706(f)	122
Concrete bearing—Sec. 91.2608, .4305	230, 339
Concrete nonbearing— Sec. 91.2608	230
Definition—Sec. 91.0403(p)	49
Definition of, temporary— Sec. 91.1706(b)	121
Fire-resistive— Sec. 91.0102(a), .4305	13, 339
Fire-resistive required— Sec. 91.1705	118-121
Flammable materials— Sec. 91.1706(c)	122
Framing requirements— Sec. 91.2617	231
Incombustible—Sec. 91.1705, .4305	118-121, 339
Lathing of (see LATHING)	
Masonry bearing— Sec. 91.2418	173
Masonry nonbearing— Sec. 91.2419	175
Mezzanine—Sec. 91.1707	123
Permanent—Sec. 91.0403(p)	49
Plastering of (see PLASTERING)	
Projection room—Sec. 91.4002	319
Solid plaster, with studs— Sec. 91.4704	360
Solid plaster, without studs— Sec. 91.4704	360
Type required— Sec. 91.1705, .1706(b)	118-121
Wood stud—fire-resistive— Sec. 91.4305	339
Wood stud, general— Sec. 91.2515, .4814	193, 393
PARTITIONS, NON-RATED	
Definition—Sec. 91.0403(p)	49
Legal provisions—Sec. 91.1706(b)	122
PENTHOUSE	
Area allowed— Sec. 91.1702(b), .3601(b)	116, 309
Construction—Sec. 91.3602	309
Definition—Sec. 91.0403(p)	49

Subject — Section	PAGE
Height—Sec. 91.1702, .3602	116, 309
Parapet walls— Sec. 91.1703, .3604(b)	117, 311
Roofing (see ROOFING)	
Roof structures (see ROOF STRUCTURES)	
Skylight—Sec. 91.3603, .3604	310, 311
Use of—Sec. 91.1702(b),	116, 309
PERGOLAS AND LATH HOUSES (Exempted from Code)— Sec. 91.0102(a)	13
PERMIT	
Application for—Sec. 91.0203	21
Cards—Sec. 91.0205	23
Does not allow violation— Sec. 91.0202(b)	21
Expiration of—Sec. 91.0206	24
Fees—Sec. 91.0204	22-23
Not required—Sec. 91.0102, .0201	13-15, 20-21
Not valid, when— Sec. 91.0202(b)	21
Occupancy—Sec. 91.0103, .0315	15-19, 41-43
Owners consent—Sec. 91.0203.1	22
Owner's responsibility— Sec. 91.0211(a)	27
Plans required for— Sec. 91.0207, .0210(a)	24-25, 27
Required—Sec. 91.0102, .0201	13-15, 20-21
Revocation of—Sec. 91.0206	24
Temporary—Sec. 91.0201(c)	21
Withholding of—Sec. 91.0203	21
PETROLEUM STORAGE —Div. 10	88
Exempted from Code— Sec. 91.0102(a)	13
PIERS	
Dwelling footing—Sec. 91.4807(d)	375
Masonry—Sec. 91.2417(c)	168
PILES (see FOOTINGS AND FOUNDATIONS—Div. 28)	
PITS	
Protection required—Sec. 91.4405	350
PLANK FLOOR (see FLOOR)	
PLANS AND SPECIFICATIONS	
Alterations to—Sec. 91.0211(d), .0204	27, 22-23
Application to be filed— Sec. 91.0208	25
Approval of—Sec. 91.0211	27-28
Changes to—Sec. 91.0211	27-28
Competitions for— Sec. 91.0210(b)	27
Definition of—Sec. 91.0403(p)	49
Design of (see DESIGN)	
Fees for checking— Sec. 91.0209	25-26
Information required— Sec. 91.0210	27
Keeping of—Sec. 91.0211(f)	28
Keeping on job—Sec. 91.0211(e)	28
More than one building— Sec. 91.0209	25-26
Plot plan—Sec. 91.0207, .0309(c)	24-25, 34
Required—Sec. 91.0207	24-25
Requirements for—Sec. 91.0210	27
Signature required— Sec. 91.0210	27
Site plat—Sec. 91.0207, .0309(c)	24-25, 34
Superintendent may waive requirement—Sec. 91.0207(b)	25

Subject — Section	PAGE
PLANTING	
Hillside cut and fill slopes— Sec. 91.3007	271
PLASTERING (see LATHING and PLASTERING)	
PLASTERBOARD (see WALLBOARD)	
Lath—Sec. 91.4701, .4703	358, 359-360
Lath, application— Sec. 91.4703	359-360
PLASTICS	
Approved—Sec. 91.6102	448
Architectural projections— Sec. 91.4502(c)	353
Ceilings—Sec. 91.1706(f)	122
Glazing—Sec. 91.1711(a)	126
Installation—Sec. 91.6103	448
Malls, signs in—Sec. 91.1705(d)	122
Roofing—Sec. 91.3202(a)	286
Skylights—Sec. 91.3603	310
Veneer—Sec. 91.2903	260
PLATFORMS (Exempted from Code)— Sec. 91.0102(a), .0201(b)	13, 20
PLATES	
Bolting of—Sec. 91.1708, .4809(c)	124, 378
Sill—Sec. 91.2517(c), .4809	194, 378
Steel for wood columns— Sec. 91.2510, 2517(c)	194
Stud partition—Sec. 91.2515, .2517(d), .4814(d)	195, 393
PLATE GIRDERS	
Combined shear and tension stresses—AISC 1.10.7	244
Splices—AISC 1.10.8	244
Stiffeners—AISC 1.10.5	244
PLYWOOD	
Exterior—Sec. 91.4819	400
Floors—Sec. 91.4810	379
Roofs—Sec. 91.4812	383
Thickness—Sec. 91.4810(g)	381
PNEUMATICALLY PLACED CONCRETE— Sec. 91.2621	233
POLES (Exempted from Code)— Sec. 91.0102(a)	13
POOL (see SWIMMING POOL)	
PORTLAND CEMENT	
Admixture for—Sec. 91.2603.6	223
Fireproofing—Sec. 91.4302	329
Mortar—Sec. 91.2403(o)	152
Plaster—Sec. 91.4702	358
Testing of—Sec. 91.2603.2	222
POST SIGNS—Sec. 91.5211	441
PRECAST SOLID WALL PANELS	
Construction—Sec. 91.2616	230
Design—Sec. 91.2616	230
Stress—Sec. 91.2616	230
Wall thickness—Sec. 91.2616.3	230
PREFABRICATORS	
Licensing of—Sec. 91.0310(g)	37
PRESSURE-TREATED WOOD	
Cedar in lieu of—Sec. 91.3105(c)	282
Definition—Sec. 91.3101	281
General provisions— Sec. 91.3101, .3107	281, 282
Redwood in lieu of— Sec. 91.3105	282
PRISM TEST—Sec. 91.2404	155
PROJECTION ROOM	
Construction—Sec. 91.4002, .4003, .4007	319, 320
Definition—Sec. 91.0403(p)	49
Dimensions—Sec. 91.4002	319
Doors—Sec. 91.4003, .4004	319
Equipment—Sec. 91.4007	320

Subject — Section	PAGE
Exits—Sec. 91.4003, .4004	319
Film storage—Sec. 91.4006	320
Plumbing—Sec. 91.4008	320
Ports—Sec. 91.4003	319
Size—Sec. 91.4002	319
Ventilation—Sec. 91.4005	319
PROJECTION SIGNS (see PROJECTIONS FROM BUILDINGS)	
PROJECTIONS FROM BUILDINGS	
Architectural—Sec. 91.4501(d), .4502	352, 353
Awning—Sec. 91.4501(d), .4503	352, 353
Awning must be retractable— Sec. 91.4501(d)	352
Balcony—Sec. 91.4504	355
Bay window—Sec. 91.4501(d), .4505	352, 355
Canopies, cloth, on dwellings— Sec. 91.0102(a), .4501(d)	13, 352
Dwelling (see DWELLINGS)	
Earthquake precautions— Sec. 91.0103	15-19
Fire escape—Sec. 91.4507	356
Maintenance—Sec. 91.0103(a)	15
Marquee—Sec. 91.4509	356
Prohibited into setbacks— Sec. 91.4501(b)	352
Sign—Sec. 91.5202, .5207	433, 439
Stairway—Sec. 91.4508	356
Sprinkler connections— Sec. 91.4510	357
Standpipe connections— Sec. 91.4510	357
PROPERTY ROOMS, STAGE—Div. 39	316
PROPERTY LINE	
Between buildings— Sec. 91.0504(d)	62
Definition of—Sec. 91.0403(p)	49
Openings facing (see OPENINGS)	
PROSCENIUM	
Stage requirements—Div. 39	316
Wall, definition— Sec. 91.0403(p)	49
PROTECTION (see SECURITY)	
PUBLIC GARAGE (see GARAGES)	
PUBLIC WAY PROTECTION	
Barrier—Sec. 91.4401(a)	347
Canopy—Sec. 91.4402, .4403	347, 349
Fence—Sec. 91.4401, .4402	347
Maintenance—Sec. 91.4403(c)	349
Removal—Sec. 91.4403(a)	349
Replacing glass exempt— Sec. 91.0102(a)	13
Walkway construction— Sec. 91.4403(b)	349
Walkway required— Sec. 91.4401, .4402(d)	347, 348
PUBLIC WORKS (Exempted from Code)—Sec. 91.0102(a)	13
PURPOSE OF CODE— Sec. 91.0101, .0102	13, 13-15
— Q —	
QUARRYING (Exempted from Code)— Sec. 91.0102(a)	13
— R —	
RADIO TOWERS—Sec. 91.1702(b)	116
Exempted from Code— Sec. 91.0102(a)	13
RAFTERS	
For dwellings—Sec. 91.4812	383
Other buildings (see WOOD)	

Subject — Section	PAGE	Subject — Section	PAGE
RAILWAY STATIONS (see GROUP B OCCUPANCIES)		ROOF CONSTRUCTION	
RAMPS		Asphalt Shingles—	
General requirements—		Sec. 91.3202(h)	286
Sec. 91.3306(a)	299	Attic, partitions required—	
Special requirements (see GROUP A, B, etc.)		Sec. 91.1703, 3201	117, 284
RECESSES		Design (see DESIGN)	
In masonry walls—		Drainage—Sec. 91.3203	290
Sec. 91.2417(d)	168	Dwelling (see DWELLINGS)	
REDUCTION, LIVE LOAD (see Div. 23)		Fire protection methods—	
REDWOOD (see WOOD)		Sec. 91.4306	339
As decay-resistant wood—		Fire protection omitted—	
Sec. 91.3105	282	Sec. 91.1705, .1706	118-121, 121-122
In lieu of treated wood—		Fire protection required—	
Sec. 91.3105	282	Sec. 91.1705	118-121
Stresses (see WOOD)		Greenhouse—Sec. 91.3603(h)	311
REFRIGERATION MACHINERY ROOMS —		Greenhouse live loads—	
Sec. 91.4108	326	Sec. 91.2302(a)	132
REGISTERED INSPECTOR —		Insulation—Sec. 91.3202(n)	287
Sec. 91.0310, .0311	36-37, 38-39	Live loads for—Sec. 91.2302(a)	132
REINFORCED CONCRETE		Monitors—Sec. 91.3603, .3604	310, 311
(see CONCRETE)		Overflow scuppers, dwelling—	
REINFORCED MASONRY		Sec. 91.4812	383
(see MASONRY)		Overflow scuppers, general—	
REINSPECTION —Sec. 91.0103, .0315	15-19, 41-43	Sec. 91.3203(c)	288
RELOCATION PERMIT —Div. 54		Parapet walls—Sec. 91.1703, .3604(b)	117, 311
Sec. 91.5403	442	Partition, attic—Sec. 91.3201	284
REPAIRS		Penthouse (see PENTHOUSES)	
In fire districts—Sec. 91.1603(b)	112	Projection—Sec. 91.4903(g)	412
Outside fire districts—		Roofing (see ROOFING)	
Sec. 91.0103	15-19	Roof structures (see ROOF STRUCTURES)	
REPORTS		Sawtooth—Sec. 91.3603, .3604(a)	310, 311
Of cement tests—Sec. 91.2603.2.2	221	Separation walls above—	
Of compliance—Sec. 91.0315(c)	42	Sec. 91.0503(c)	59
Of registered inspectors—		Structures above roof—	
Sec. 91.0311(b)	38-39	Sec. 91.1702, .1703	114, 117
Of steel test—Sec. 91.2701(b)	243	Tent structures—Sec. 91.1709	125
Of wood tests—Sec. 91.3107	282	ROOF SIGNS —Sec. 91.5206	438
REROOFING (Exempted from Code)—		ROOF STRUCTURES	
Sec. 91.0201(a)	20	Access through or around—	
RESIDENCES (see DWELLINGS)		Sec. 91.3601(e)	309
RESTAURANTS (see FOOD ESTABLISHMENTS AND OCCUPANCY CLASS)—Sec. 91.0502	57-59	Area allowed—Sec. 91.1702(d), .3601(b)	116, 309
RETAINING WALLS		Construction—Sec. 91.3601(d)	309
Exempt from Code, when—		Definition—Sec. 91.0403(r)	49
Sec. 91.0102(a)	13	Height—Sec. 91.1702(a), .3601(c)	116, 309
Definition of—Sec. 91.0403(r)	49	Metal housing, equipment—	
Design of—Sec. 91.2309	247	Sec. 3602(c)	309
REVIEWING STANDS —Sec. 91.3321	306	Monitors—Sec. 91.3604(a)	311
RIBBON FOR JOIST —		Parapet walls—Sec. 91.1703, .3604(b)	117, 311
Sec. 91.2506(f), .4810(b)	182, 373	Penthouse (see PENTHOUSE)	
RISERS (see Div. 33)		Roofing (see ROOFING)	
RIVET OR RIB BOLTS (see BOLTS)		Skylights—Sec. 91.3603, .3604	310, 311
RIVETS		Use of—Sec. 91.1702(b)	116
AISC 1.5.2, 1.16	244	ROOF TRUSS (see ROOF CONSTRUCTION)	
Assembly procedure—		ROOFING (Div. 32)	
AISC 1.23	245	Asbestos—Sec. 91.3202(m)	288
Details of connection—		Drainage—Sec. 91.3203	288
AISC 1.15	244	Dwelling (see DWELLINGS)—	
In combination with bolts—		Sec. 91.4813	385
AISC 1.15.11	244	Fire-retardant specifications—	
In combination with welds—		Sec. 91.3202	282
AISC 1.15.10	244	Glass fiber—	
ROD BRACING SYSTEMS —		Sec. 91.3202(b), (c), (d) and (e)	285-286
Sec. 91.0103, .2306(c), .2702(b)10	145, 242	Greenhouse (skylight)—	
ROLLING SHUTTERS		Sec. 91.3603(h)	311
For fire protection—			
Sec. 91.4307	341-346		
Prohibited for exits—			
Sec. 91.3303(f)	294		

Subject — Section	PAGE
Group R occupancies—	
Sec. 91.4813	385
In fire districts, new—	
Sec. 91.1603(h)	113
In fire districts, repairs—	
Sec. 91.1603	112-113
Marques—Sec. 91.4509	356
Out of fire district, repairs—	
Sec. 91.0103(d)	16
Overflow scuppers, dwelling—	
Sec. 91.3203	288
Overflow scuppers, general—	
Sec. 91.3203	288
Repairs in fire district—	
Sec. 91.1602, 1603	112
Specifications, dwelling—	
Sec. 91.4813	385
Specifications, general—	
Sec. 91.3202	284
Tent structures—Sec. 91.1709	125
Tile—Sec. 91.3202(k)	287
ROOM, definition of—	
Sec. 91.0403(r)	49
Refrigeration machinery—	
Sec. 91.4108	326
Special hazard—Sec. 91.0509	70
RUBBISH	
Dumping (Exempted from Code)—	
Sec. 91.0102	15
RUNNING TRACKS—Sec. 91.0808	83

— S —

SAFETY PROVISIONS—Div. 44	347
SALESROOMS (see GROUP G and E)	
SAND	
Bearing value of—Sec. 91.2803	248-251
Concrete—Sec. 91.2603.3	222
Mortar—Sec. 91.2403	153
Plaster—Sec. 91.4702	358
SANDBLASTING—Sec. 91.0103(k), .0210	17, 27
SAND LIME BRICK—Sec. 91.2403(c)	153
SANITARIUMS (see GROUP D OCCUPANCIES)	
SCHOOLS (see GROUP S OCCUPANCIES)	
SCOPE OF CODE—	
Sec. 91.0101, .0102	13-15
SCREWS	
Working loads—Sec. 91.2510(d)	185
Oblique loads—Sec. 91.2510(d)	185
Withdrawal strength—	
Sec. 91.2510(d)	185
Metal side plates—	
Sec. 91.2510(d)	185
Installation—Sec. 91.2510(d)	185
SCUTTLE (not for dwellings)—	
Sec. 91.3201	284
SEATING (see GROUP A and B)	
Aisles for, general—Div. 33	289
SECURITY	
Doors, locks and windows—	
Div. 67	449
SECURITY PROVISIONS	
Definitions—Sec. 91.6705	449
Doors—Sec. 91.6711, 12, 13, 14	450-451
Entry vision—Sec. 91.6706	450
General requirements—	
Sec. 91.6702	448
Glazed openings—Sec. 91.6720, 21, 22, 23	452
Glazing—Group G—Sec. 91.6721	452
Tests—Sec. 91.6730, 31, 32	453
Windows—Sec. 91.6722	452

Subject — Section	PAGE
SELF-CLOSING DOORS	
Attic partition—Sec. 91.3201(b)	284
Fire—Sec. 91.4307	342
Food establishment vestibules—	
Sec. 91.0508(i)	68
Projection room—	
Sec. 91.4003	319
Shaft enclosure—Sec. 91.1703(b)	117
Stair enclosure—Sec. 91.3308	299
Vault (see VAULTS, FILM AND EXPLOSIVES)	
SEPARATION	
Fire and occupancy—	
Sec. 91.0503(d)	61
Living area from food establishments—Sec. 91.0508(o) ..	70
Of buildings, earthquake—	
Sec. 91.2306	145
Wall, definition of—	
Sec. 91.0403(s)	50
SHAFTS (see TYPE I, II, III, etc.)	
Enclosures of, general—	
Sec. 91.1703(b)	117
Fire rating required—	
Sec. 91.1705	118
Misdemeanor—Sec. 91.4408	352
Stair or ramp—Sec. 91.3309	300
SHEAR (see DESIGN)	
SHEAR WALLS	
Allowable loads—	
Sec. 91.2514, Tables 25-J-N	191, 216, 218
Diagonal brace—	
Sec. 91.4817(b)2	398
Diagonal sheathing—	
Sec. 91.2514(a)	191
Fiberboard—Sec. 91.2515(a)	193
Framing—Sec. 91.2514, .2515	191, 193
Plaster—Sec. 91.2515(b), (c)	193
Plywood—Sec. 91.2514(c)	192
Shape—Sec. 91.2514(a)	191
Wallboard—Sec. 91.2515(b)	193
SHEATHING	
Diaphragm (see DIAPHRAGMS)	
Plywood thickness—Sec. 91.1703, .4810(g), .4812(f)	117, 381, 385
Spacing—Sec. 91.4813(c)	390
Weatherproofing of, dwellings—	
Sec. 91.4813	385
Weatherproofing of, Group H	
Sec. 91.4813	385
Wood board, dwelling—	
Sec. 91.4810(g), .4812(f), (g)	381, 385
SHEDS, CONSTRUCTION (Exempted from Code)—Sec. 91.0201(a)	20
SHINGLES OR SHAKES	
For dwellings—Sec. 91.4813	390
Repair, fire districts—	
Sec. 91.1603(b)	111
SHOW WINDOWS—Sec. 91.1706	121
SHOWERS	
Enclosures—Sec. 91.4909(d)	420
Walls—Sec. 91.4909(c)	420
SHUTTERS	
Fire-resistive—Sec. 91.4307	342
Projection room—Sec. 91.4003	319
SIDEWALK PROTECTION—	
Sec. 91.0201(a), Div. 44	20, 347
SIDING (see HOUSING CONSTRUCTION)	
SIGNATURE OF RESPONSIBILITY (see COMPUTATIONS REQUIRED)—	
Sec. 91.0210(b)	27
SIGNS—Div. 52	432
Definition—Sec. 91.0403(s)	49
Exit—Sec. 91.3310	302

Subject — Section	PAGE	Subject — Section	PAGE
Freeway, adjacent to— Sec. 91.5202(b)	433	Exterior, projection of— Sec. 91.4508(a)	356
On marquees—Sec. 91.4509, 5207	356, 439	Shafts required, when— Sec. 91.1705(b)	118
Prohibited locations— Sec. 91.5202(g)	435	Winders—Sec. 91.3305(d)	296
Requirements for—Div. 52	432	STAIRWAY	
Roof signs— Sec. 91.5206(a), (d)	438, 439	Exterior, definition of— Sec. 91.3305(j)	298
SITE PLAT —Sec. 91.0207,	24-25, 34	STANDPIPES (see GROUP A, B, etc.)	
SITE DRAINAGE —Sec. 91.3008(j)	273	Definitions (dry or wet)— Sec. 91.0403	45, 51
SKYLIGHTS		General requirements— Sec. 91.0511	71
Construction, general— Sec. 91.3603	310	Installation (see Plumbing Code)	
Definition of—Sec. 91.0403(a)	49	Stage—Sec. 91.3904(c)	317
Dwelling—Sec. 91.3603(g)	311	STATE OF CALIFORNIA	
Greenhouse—Sec. 91.3603(h)	311	(Exempted from Code)— Sec. 91.0102(a)	13
SLATE ROOFING —Sec. 91.3202	285	STEEL, REINFORCING	
SLAUGHTERHOUSE		(see CONCRETE)	
General requirements— Sec. 91.0508	65-70	STEEL AND IRON	
SMOKEPIPE		Adjustable tension members— Sec. 91.2702(b)10	244
Connections—Sec. 91.3701(b)	312	Alignment—Sec. 91.2702(b)15	245
Definition—Sec. 91.3705(a)	313	Allowable unit stresses— AISC, Sec. 1.5	243
Material of—Sec. 91.3705(c)	313	Anchor bolts—AISC, Sec. 1.22	243
SMOKESTACKS —Sec. 91.3701, 3704	312, 313	Axial compression and bending— AISC, Sec. 1.6.1	243
SOIL (see FOOTINGS AND FOUNDATIONS)		Axial tension and bending— AISC, Sec. 1.6.2	243
SOLID MASONRY —Sec. 91.2412	163	Bending—AISC, Sec. 1.5.1.4	243
SOUND TRANSMISSION CONTROL		Bolts—AISC, Sec. 1.16	243
Airborne—Sec. 91.4903(h)2	412	Bolts, Rivets and threaded parts— AISC, Sec. 1.5.2	243
General—Where required— Sec. 91.4903(h)1	414	Built-up members—AISC 1.18	243
Impact—Sec. 91.4903(h)3	412	Cold formed steel construction— Sec. 91.2701(a)2	243
SPECIAL HAZARD ROOMS — Sec. 91.0509	70	Column bases—AISC, Sec. 1.21	243
SPECIFICATIONS (see PLANS AND SPECIFICATIONS)		Combined stresses—AISC, Sec. 1.6.243	
SPECIFICATIONS, MATERIAL — Sec. 91.0404	51-56	Composite construction— AISC, Sec. 1.11 and 91.2702(b)7	243, 244
SPIRES —Sec. 91.1702(b)	116	Compression—AISC, Sec. 1.5	243
SPRAY ROOMS		Connections—AISC, Sec. 1.15 and 91.2702(b)10	243, 244
Area—Sec. 91.4103(b)	322	Continuous spans—AISC, Sec. 1.12.243	
Construction—Sec. 91.4103(c), (d)	322	Corrosion resistance— Sec. 91.2701(c)	243
Electrical—Sec. 91.4103(h)	323	Deflection ponding— AISC 1.13, Sec. 91.2702(b)8	244
Exits—Sec. 91.4103(e)	322	Ductile moment-resisting space frames—Sec. 91.2703	246
Floors—Sec. 91.4103(f)	323	Effective areas of welded metal— AISC, Sec. 1.14.7	243
General—Sec. 91.4103(a)	322	Gross and net sections— AISC, Sec. 1.14	243
Ventilation—Sec. 91.4103(g)	323	Identification by test— Sec. 91.2701(b)	243
SPRINKLERS		Lateral bracing—AISC, Sec. 2.9	243
Basement required— Sec. 91.1603(g)	113	Loads—AISC, Sec. 1.21.1	243
Film storage—Sec. 91.4104(j)	324	Material standards—AISC, Sec. 1.4 and 91.2702(b)2, 3	243, 244
For Group E-1—Div. 10	88	Oxygen cutting AISC, Sec. 1.23.2	243
For Group F—Sec. 91.1107	103	Plastic design—AISC, Part 2 and 91.2702(b)19, 20, 21	243
Installation (see Plumbing Code)		Plate girders—AISC, Sec. 1.10	243
Permit greater areas— Sec. 91.0506	62-64	Riveted and bolted construction— AISC, Sec. 1.23.4, 1.23.5 and 91.2702(b)16	243, 244
Stage—Sec. 91.3903(d)	317	Rivets—AISC, Sec. 1.16	243
Type I buildings over 75' in height—Sec. 91.1802(c)	130	Rolled beams—AISC, Sec. 1.10	243
STADIUM (see GROUP B-3 OCCUPANCIES)—Sec. 91.0502(b), 2307(d)	57, 146	Shear tension—AISC, Sec. 1.6.3	243
STAGE, ASSEMBLY ROOM (see Div. 39)		Sideway—AISC, Sec. 1.8	243
STAIRS (see EXITS—Div. 33, and GROUP A, B, etc.)		Simple spans—AISC, Sec. 1.12	243
Design for housing— Sec. 91.3305	296		
Design, general—Div. 33	440		
Design (see GROUP A, B, D, S, etc.)			
Emergency escape from stair shaft—Sec. 91.1802(e)	27		

Subject — Section	PAGE	Subject — Section	PAGE
Slenderness ratio—		STRUCTURAL PLYWOOD	
AISC, Sec. 1.8, 91.2703(f)	246	Diaphragms and Shear walls—	
Stability and slenderness ratio—		Sec. 91.2514(c)	191
AISC, Sec. 1.8	246	General—Sec. 91.2501(g)	177
Steel ductile moment resisting		Grading standard—Sec. 91.2502	179
space frame—Sec. 91.2703	246	Stresses—Sec. 91.2504(a),	
Stiffened elements—		Table No. 25-B	180, 206
AISC, Sec. 1.9	243	Shear values—Sec. 91.2514(c),	
Straightness—AISC, Sec. 1.23.8	243	Table No. 25-J	191, 216
Stress reversal—AISC, Sec. 1.7		STRUCTURE, definition—	
and 91.2702(b)6	243, 244	Sec. 91.0403	49-50
Structural steel stresses—		STRUCTURAL ENGINEERING PLANS—	
AISC, Sec. 1.5.1	243	Sec. 91.0210(c)	27
Symbols and notations—		STRUCTURAL INSPECTORS—	
AISC Nomenclature		Sec. 91.0311.1	40
Sec. 91.2701(a)1	243	STRUCTURES (see TYPE I, II, III, etc.)	
Tests—Sec. 91.2701(b)	244	Parking lot—Sec. 91.1605(g)	114
Unstiffened elements—		STUCCO (see PLASTERING)	
AISC, Sec. 1.9	243	STUDS, WOOD—Sec. 91.2517(d),	
Welded construction—		.4814	195, 393
Sec. 91.2702(b)17	243	SUBDIVISION ADVERTISING	
Welds—		STRUCTURES—Sec. 91.5212	441
AISC, Sec. 1.17 and		SUSPENDED CEILINGS	
91.2702(b)11	243, 244	Construction—Sec. 91.4705	361
Width-Thickness ratios—		Fire-resistive—Sec. 91.4304,	
AISC, Sec. 1.9	243	.4306	334, 339
Workmanship—AISC, Sec. 1.23 and		SWIMMING POOLS (see RETAINING	
91.2702(b)16, 17	243, 245	WALLS and CITY PLUMBING	
STIFFENERS—AISC 1.10.5	243	CODE—Sec. 91.0403(r)	50
STONE (see MASONRY)		Exempted from Code—	
Veneer—Sec. 91.2902, .2903	258, 260	Sec. 91.0201(a)	20
STONE MASONRY—Sec. 91.2409	162	Fences required for—	
STORAGE		Sec. 91.4407	351
Explosives—Div. 41	321	Water clarity—Sec. 91.0103(g)	30
Film—Sec. 91.4104	324		
STORAGE RACKS			
Design—Sec. 91.2305(k)8, Table			
No. 23-B	142, 134		
STORY, definition of—			
Sec. 91.0403(s)	46		
STREET FRONTS			
Combustible material—			
Sec. 91.1706	121		
General provisions—			
Sec. 91.1706(a)	121		
STRESS (see DESIGN)			
STRESS ANALYSIS—			
Sec. 91.2301(b)	131		
STRUCTURAL FRAME			
(see TYPE I, II, III)—			
Sec. 91.1705	118		

— T —

TANKS

Design—Sec. 91.2305 (m), (n)6,	
Table No. 23-B	142, 132
Exempt, when—Sec. 91.0102(a)	13
In fire districts—Sec. 91.1601(b)	112
Roof—Sec. 91.1702(b)	116

TEMPORARY STRUCTURES

Construction sheds—	
Sec. 91.0201, .1603(a)	20, 113
For public protection—	
Sec. 91.4401, .4402	347, 348
In fire districts—	
Sec. 91.1603(a)	113

TENTS—Sec. 91.0201(a), .1709

TERMITES, inspection—	
Sec. 91.0310(c)	36

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Subject — Section	PAGE	Subject — Section	PAGE
TESTS		For housing—Sec. 91.4908,	
Cement—Sec. 91.2603.2	222	.4909	418, 419
Concrete admixtures—		General—Sec. 91.0512	70
Sec. 91.2603.6.2	224	Plumbing fixtures required	
Concrete aggregates—		(see Sec. 1211, Plumbing Code)	
Sec. 91.2603.3	222	Ventilation—Sec. 91.0512(b)	71
Concrete, general—		TORSION —Sec. 91.2611	230
Sec. 91.2604.3	225	TOWERS	
Concrete, reinforcing—		Design—Sec. 91.2305	134
Sec. 91.2603.5.13	228	Exempt, when—Sec. 91.0102(a),	
Masonry—Sec. 91.2404	155	.0201(a)	13, 20
New material—Sec. 91.0303	30	General—Sec. 91.1702,	
Soil (see FOOTINGS AND		.1705	116, 118
FOUNDATIONS)		TRAILER PARKS	
Steel—Sec. 91.2701(b)	243	Certificate of occupancy	
Wood, treated—Div. 31	281	Sec. 91.0315(a)	41
Wood, glued laminated—		TRANSFORMER VAULTS —	
Sec. 91.2511(g)	190	Sec. 91.0509, .4107	70, 326
THEATERS (see Group A and B)		TREATED WOOD	
THIMBLES, CHIMNEY		Cedar in lieu of—Sec. 91.3105(c)	282
Sec. 91.3702, .4822	309, 401	Definition of—Sec. 91.3101	281
TICKET BOOTHS		General provisions—Sec. 91.3101,	
(see GROUPS A and B)		.3107(a)	281, 282
TILE, CERAMIC (see CERAMIC TILE)		TRIM —Sec. 91.1703,	
TIMBER (see WOOD)		.1706(f)	117, 122
TIMBER CONNECTORS		TRUSSES	
Working loads—Sec. 91.2510(a)	185	Design of (see DESIGN)	
Tension net section—		Fire protection of—Sec. 91.4306	339
Sec. 91.2510(a)	185	Not fire protected—	
Installation—Sec. 91.2510(a)	185	Sec. 91.1706	121
TITLE OF CODE —Sec. 91.0101	13	TWO-WAY SLABS —Sec. 91.2613	230
TOILETS (see GROUP A, B, etc.)		TYPE I BUILDINGS	
Facilities during construction—		Area—Sec. 91.0506,	
Sec. 91.4406	350	.4502	63, 352
For food establishments—		Awnings—Sec. 91.4503	353
Sec. 91.0508(i)	68	Balconies—Sec. 91.4504	355

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Subject — Section	PAGE
Ceilings—Sec. 91.1705, .4306	118, 339
Design, engineering—Div. 23	131
Exterior walls—Sec. 91.1705	118
Facing, masonry—Div. 24	151
Fireproofing, general—Div. 43	331
Hallways and corridors (see EXITS)	
Height of—Sec. 91.1702, .1705	116, 118
Location of—Sec. 91.0504	62
Marquees—Sec. 91.4509	356
Partitions, doors and trim— Sec. 91.1703, .1706(f)	117, 122
Projections, exteriors—Div. 45	352
Roof trusses— Sec. 91.1706, .4306(d)	122, 342
Separation of occupancies— Sec. 91.0503, Div. 43	60, 331
Trusses, roof— Sec. 91.1706, .4306	121, 339
Veneer, masonry (see FACING) Div. 29	258
Walls, exterior—Sec. 91.1705, .1706	118, 122

TYPE II BUILDINGS

(Use TYPE I BUILDING Index)

TYPE III BUILDINGS

(Use TYPE I BUILDING Index)

TYPE III-A BUILDINGS

(Use TYPE I BUILDING Index)

TYPE III-B BUILDINGS

(Use TYPE I BUILDING Index)

TYPE IV BUILDINGS

Exterior walls, fire districts— Sec. 91.1604(b)	112
Exterior walls, general— Sec. 91.0504, .1705, .1706(f)	62, 118, 122
(Otherwise use TYPE I Index)	
Nonrated partitions— Sec. 91.1706(b)	121

TYPE V BUILDINGS

Bolting to footings— Sec. 91.1708(b), .4809	124, 376
Dwellings (see DWELLINGS)	
Footings (see FOOTINGS AND FOUNDATIONS)— Sec. 91.1708, .4809	124, 376
Not in Fire District No. 1— Sec. 91.1604(a)	118
One-hour construction— Sec. 91.1708(f)	122
Weatherproofing—Sec. 91.4813	385
(Otherwise use Type I Index)	

— U —**UNBURNED CLAY MASONRY**

Sec. 91.2405	157
--------------------	-----

UNDERFLOOR SPACE—

Sec. 91.4928(e)	425
-----------------------	-----

UNDERPINNING

Foundations—Sec. 91.2810, 11	256
------------------------------------	-----

UNFINISHED BUILDINGS—

Sec. 91.0206(c)	24
-----------------------	----

UNSAFE BUILDINGS—

Sec. 91.0103(f), (j)	17
----------------------------	----

UNSTABLE PROPERTY—

Sec. 91.0308(d)	33
-----------------------	----

— V —**VALUATION—**

Sec. 91.0204, .0209(a)	22-23, 25
------------------------------	-----------

Subject — Section	PAGE
VAULTS (see FILM VAULTS and EXPLOSIVES VAULTS)	
VAULTS, TRANSFORMER— Sec. 91.0509, .4107	70, 326
VENEER (see FACING)	
Adhesive veneer—Sec. 91.2903	260
Anchorage of glass— Sec. 91.2903(d)	260
Anchorage of masonry— Sec. 91.2902, .2903	258, 260
Backing—Sec. 91.2904	261
Definition (see FACING)— Sec. 91.0403(v)	51
Glass, sheet—Sec. 91.2903(d)	260
Height of glass— Sec. 91.2903(d)	260
Height of masonry— Sec. 91.2904	261
Masonry—Sec. 91.2901, .2902	258
Masonry, installation— Sec. 91.2902, .2903	260
Plastic—Sec. 91.2903(e)	261
Supports for masonry—Sec. 91.2902	260
Terra Cotta facings— Sec. 91.2903(b), .2904(c)	260-261
Tied veneer—Sec. 91.2902	260
VENTILATION	
Appliance— Sec. 91.3701, .3707	312, 315
Basements (residential)— Sec. 91.4927(d)	425
Boiler room—Sec. 91.0509	70
Cellulose-nitrate film-processing rooms—Sec. 91.4106(d)	325
Cutting rooms (cellulose-nitrate film)—Sec. 91.4106(d)	325
Explosives Vaults—Sec. 91.4105(g)	325
Film vault—Sec. 91.4104(h)	324
Garage (Group F)— Sec. 91.1105, .1107	102, 103
Group A—Sec. 91.0605	73
Group B—Sec. 91.0605	76
Group D—Sec. 91.0905	86
Group E—Div. 10	88
Group F—Sec. 91.1105	102
Group H—Sec. 91.4911	420
Group J—Sec. 91.1505	108
Group R—Sec. 91.4911(f)	420
Group S—Sec. 91.0805(b)	81
Hazardous material rooms Sec. 91.4102(k)	322
Heating—Sec. 91.4921	422
Motion picture laboratories— Sec. 91.4106(d)	325
Projection room—Sec. 91.4005(c)	319
Public garage— Sec. 91.1105, .1107	102, 103
Spray rooms—Sec. 91.4103(g)	322
Stages—Sec. 91.3904(c)	317
Toilet rooms, general— Sec. 91.0512	71
Under floor, dwellings— Sec. 91.4809(a)	376
Vaults, explosive—Sec. 91.4105(g)	324
Vaults, film—Sec. 91.4104(h)	325
VENT SHAFTS	
Enclosing openings— Sec. 91.1703(b)	117
Required—Sec. 91.1703(b)	117
Types required—Sec. 91.1705	120
VERTICAL JOINTS—Sec. 91.2413(c)	164

Subject — Section	PAGE
VERTICAL OPENINGS—	
Sec. 91.1703(b)	117
— W —	
WADING POOLS (see SWIMMING POOL)	
WALLBOARD	
(see GYPSUM WALLBOARD)	
WALLS (see also GROUP A, B, etc.)	
Bearing—Sec. 91.2418	173
Boiler room—Sec. 91.0509	70
Cavity—Sec. 91.2410	162
Division—Sec. 91.0506(j)	63
Exempted from Code—	
Sec. 91.0102(a)	13
Exterior, Fire District No. 1—	
Sec. 91.1604	113
Exterior, fire rating of—	
Sec. 91.0504, .1705	61, 118
Exterior, general—	
Sec. 91.0504, .1705	61, 118
Exterior, openings in—	
Sec. 91.0504, .1704	61, 117
Exterior, Type IV buildings—	
Sec. 91.1604(b)	113
Fire-resistive, Fire District No. 1—	
Sec. 91.1604(b)	113
Fire-resistive required—	
Sec. 91.1704, .1705	117, 118
Footings (see FOOTINGS AND FOUNDATIONS)	
Interior, general—	
Sec. 91.0503, .1705	60, 118
Interior, openings in—	
Sec. 91.0503, .4307	60, 342
Masonry—Sec. 91.2418, .2419	173, 175
Non-bearing—Sec. 91.2614, .2419	230, 175
Openings, Fire District No. 1—	
Sec. 91.1604	113
Openings in, general—	
Sec. 91.0504, .1704	61, 117
Openings in, interior—	
Sec. 91.0503	60
Parapet—Sec. 91.1703, .3604(b)	117, 311
Partition (see PARTITIONS)	
Partition, nonrated—	
Sec. 91.1706(b)	121
Projection room—Sec. 91.4001	319
Reinforced concrete (see CONCRETE)	
Retaining, general—Sec. 91.2309	147
Sheathing, dwelling—Sec. 91.4814	393
Solid masonry (see MASONRY)	
Stone (see MASONRY)—	
Sec. 91.2409	162
Tile (see MASONRY)—	
Sec. 91.2402, .2406	151, 158
Veneered (see VENEER)—	
Sec. 91.2901, .2904	258, 261
Wood stud (see WOOD)	
WARM AIR FURNACES—Sec. 91.4111	327
WASHERS—Sec. 91.2506(f)	183
WASHING, LIQUID (Exempted from Code)—Sec. 91.0201(e)	20
WATER CEMENT RATIO—	
Sec. 91.2604.2	225
WATER CLOSETS	
(see GROUP A, B, etc.)	
Food establishment—	
Sec. 91.0508(i)	68
Housing—Sec. 91.4908	418

Subject — Section	PAGE
Sanitary requirements—	
Sec. 91.0512	72
WATERPROOF POINTING OF JOINTS	
(Exempted from Code)—	
Sec. 91.0102(a)	13
WATER TANKS	
Design—Sec. 91.2305(m), .2305(n)6, Table No. 23-B	142, 143, 206
Exempt from Code, when—	
Sec. 91.0102(a)	13
On buildings—Sec. 91.1702(b)	116
WEATHERPROOFING	
Dwellings (wood frame)—	
Sec. 91.4813	385
WELDING	
Allowable stresses—AISC, Sec. 1.5.3	243
Sec. 91.2702(b)4	244
Continuous inspection—	
Sec. 91.2702(b)4	244
Effective size—AISC, Sec. 1.14.7	243
General—AISC Sec. 1.17, Sec. 91.2702(b), 11, 12, 13	243, 244
Technique—Sec. 91.2702(b)17	244
WET STANDPIPES—(see STANDPIPES)	
WIND (see DESIGN)	
WINDOWS	
(see also GROUP A, B, etc.)	
Bay, construction of—Sec. 91.4505	355
Bay, definition—Sec. 91.4501	352
Definition of—Sec. 91.0403(w)	51
Fire—Sec. 91.4307	342
Fire windows required—	
Sec. 91.0504, .1704	62, 117
Fire windows required, fire district—Sec. 91.1604	113
Food establishment—	
Sec. 91.0508(g)	68
Glazing—Sec. 91.1711	126
Group R and H—Sec. 91.4911	420
Housing—Sec. 91.4911	420
Projection room—Sec. 91.4003	319
Show—Sec. 91.1706	121
WIND PRESSURES—	
Sec. 91.2305(n)	143
WIRED GLASS	
Fire door—Sec. 91.4307	342
Fire window—Sec. 91.4307	342
Glazing—Sec. 91.1711	126
Skylight—Sec. 91.3603	316
(see DOORS, WINDOWS)	
WIRE LATH OR MESH (see LATHING)	
WIRELESS MASTS—Sec. 91.1702(b)	116
WOOD (see DWELLINGS, DESIGN)	
Allowable stresses (see DESIGN)	
Buildings (see TYPE V BUILDINGS)	
Design—Div. 23	131
Fabrication—Sec. 91.2501(c)	177
General requirements—Div. 25	177
Housing—Div. 48	373
WOOD CONNECTIONS (see WOOD)	
WOOD FRAME (see DWELLINGS and TYPE V BUILDINGS)	
WOOD, TREATED	
Sec. 91.3101, .3107	281, 282
WORK IN PUBLIC WAY (Exempted from Code)—Sec. 91.0102(a)	13
— Y —	
YARDS (see also GROUP A, B, etc.)	
Fire district—Sec. 91.1604	113
General—Sec. 91.0504, .1704	117
Group II (see STATE HOUSING ACT)	
Ordinance (see ZONING ORDINANCE)	
Residential—Sec. 91.4904	415